TETRA TECH

P.N. 3008084.30

June 28, 2013

Mr. Derrick Golden
Waste Management Division
U.S. Environmental Protection Agency
Region I
5 Post Office Square
Mail Code OSRR07-4
Boston, MA 02109-3912

Ms. Jennifer McWeeney
Bureau of Waste Site Cleanup
Massachusetts Department of
Environmental Protection
One Winter Street, 7th Floor
Boston, MA 02108

RE: Groundwater Treatment System Report, 2012, W. R. Grace Superfund Site, Acton, Massachusetts

Dear Mr. Golden and Ms. McWeeney:

On behalf of W.R. Grace & Co.-Conn. (Grace), please find enclosed two copies of the Groundwater Treatment System Report, 2012. Please contact Thor Helgason (781-642-8775) if you have any questions regarding this document

Sincerely,

Anne B. Sheehan
Senior Hydrogeologist

CC: *electronic copies, unless indicated*
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Dave Fuerst, O&M, Inc.
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DRAFT

GROUNDWATER TREATMENT SYSTEM REPORT, 2012

W.R. GRACE SUPERFUND SITE
ACTON, MASSACHUSETTS

PREPARED FOR:

W.R. GRACE & CO. – CONN
62 WHITTEMORE AVENUE
CAMBRIDGE, MASSACHUSETTS 02140

PREPARED BY:

TETRA TECH, INC.
ONE MONARCH DRIVE, SUITE 202
LITTLETON, MA 01460

O & M, INC.
450 MONTBROOK LANE
KNOXVILLE, TN 37919

TETRA TECH PROJECT NO. 117-3008084-29

JUNE 28, 2013

TETRA TECH

One Monarch Drive, Littleton, Massachusetts 01460

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CONTENTS

TABLES

FIGURES

1 INTRODUCTION

This report provides a summary of activities associated with the operation, maintenance, and monitoring of the two groundwater extraction and treatment systems at the W.R. Grace & Co. - Conn. (Grace) Superfund Site in Acton, Massachusetts (the "Site") in 2012. The two systems are:

- The Landfill Area groundwater extraction and treatment system (Landfill Area GWTS) which began pumping and treating groundwater on May 2, 2011, and;
- The Northeast Area groundwater extraction and treatment system (Northeast Area GWTS) which began pumping and treating groundwater on April 5, 2010.

Treatment system monitoring for the Landfill Area GWTS was done in accordance with the Landfill Area Groundwater Operation and Maintenance Plan (Tetra Tech GEO and O&M, Inc., 2012b). Treatment system monitoring for the Northeast Area GWTS was done in accordance with the Northeast Area Groundwater Operation and Maintenance Plan (O&M, Inc. and GeoTrans, Inc., 2010).

This report includes information related to discharge sampling, treatment system operation and maintenance, and extraction/reinjection well operation and maintenance. Section 2 of this report provides this information for the Landfill Area GWTS and Section 3 provides this information for the Northeast Area GWTS.

2 LANDFILL AREA GWTS

As part of the final remedy selected in the ROD (USEPA, 2005) for the Site, the Aquifer Restoration System (ARS), which operated on the Grace property beginning in 1984, was replaced by the Landfill Area GWTS. The Landfill Area GWTS began operation on May 2, 2011. The Landfill Area GWTS consists of five extraction wells (MLF, SELF-1, SELF-2, SWLF-2 and WLF) pumping approximately 40 to 50 gallons per minute (gpm). The extraction wells are located downgradient of the Industrial Landfill. The treatment system consists of a metals microfiltration system to remove arsenic, iron, manganese and phosphorus, and photocatalytic oxidation to remove and destroy dissolved-phase VOCs and 1,4-dioxane from the extracted groundwater prior to surface water discharge to Sinking Pond. Documentation of the start-up of the Landfill Area GWTS was included in the Final Landfill Area Groundwater Remedial Action Report (Tetra Tech GEO and O&M, Inc, 2012c). On May 25, 2012, USEPA determined that the system was "Operational and Functional". Figure 2-1 shows the location of the five operating Landfill Area extraction wells, the equalization tank system and the Landfill Area GWTS.

2.1 LANDFILL AREA GWTS

2.1.1 GWTS MONITORING AND REMOVAL EFFICIENCY

Treatment system discharge compliance is evaluated through the collection of monthly water quality samples and quarterly whole effluent toxicity testing. Treatment system influent and effluent samples were collected monthly and analyzed for VOCs, SVOCs, 1,4-dioxane, total metals and phosphorus. The treatment system water quality results from samples collected in 2012 are summarized in Table 2-1. Effluent discharge standards are also included in Table 2-1. As shown in the Table 2-1, all effluent water quality results were below discharge standards with the exception of lead and phosphorus. Lead concentrations exceeded the maximum daily discharge limit of 14 µg/L once. On April 11, 2012, the effluent lead concentration was reported at 38 µg/L. This lead value is thought to be an error, as the lead concentration in the influent sample collected on the same day was not detected at 1 µg/L and because lead has not historically been present at elevated concentrations in the Landfill Area groundwater. The maximum lead concentration in all other treatment system influent or effluent samples collected in 2012 was 2.4 µg/L. Phosphorus exceeded the average monthly discharge limit of 18 µg/L in

May, August, September, and October. These phosphorus exceedances are thought to be laboratory or sampling errors. In May and August, the effluent concentrations exceeded the influent concentrations in samples collected on the same day.

Samples of the treatment system discharge were analyzed for whole effluent toxicity testing in March, May, August/September, and November 2012. This testing was required to be done quarterly for one year to evaluate the effects of the treatment system discharge on Sinking Pond. The March through September sample results were included in Section 4.2 of the Final Landfill Area Groundwater Remedial Action Report (Tetra Tech GEO and O&M, Inc., 2012c). The November 2012 toxicity test results and discharge permit limits are summarized in Table 2-2. The testing consisted of *Ceriodaphnia dubia* (daphnid) and *Pimephales promelas* (fathead minnow) acute and chronic toxicity tests. Effluent samples from the treatment system discharge were collected on November 12, 14 and 16 for use in the whole effluent toxicity testing, which was conducted by Aquatec Biological Sciences between November 13 and November 20, 2012. The LC50, the percent concentration of effluent that would cause death in 50 percent of the test organisms within 48 hours, for both the daphnid and the fathead minnow, was greater than a 100 percent effluent concentration. This means that more than 50 percent of the daphnid and fathead minnows survived for 48 hours in a 100 percent concentration of the Landfill Area treatment system effluent. The C-NOEC, the highest percent effluent concentration that causes no observable adverse effects on the test organisms, for both the daphnid and the fathead minnow, was 100 percent effluent concentration. This means that there were no observable adverse effects to fathead minnows or daphnid living in 100 percent Landfill Area treatment system effluent. The test results show that the LC50 and C-NOEC discharge limits for daphnid and fathead minnows were met.

GWTS contaminant removal efficiency is determined through evaluation of the monthly water quality sample results. Table 2-3 shows the treatment system removal efficiency for total VOCs, 1,4-dioxane, manganese, arsenic, iron and phosphorus. Total VOC removal efficiency in 2012 ranged between 78 and 100 percent.

Removal efficiency for 1,4-dioxane in 2012 ranged from 33 to 59 percent. The removal efficiency was not calculated for the samples collected on May 14, 2012 because the 1,4-dioxane concentration, which was reported as not detected at a detection limit of 0.196 µg/L, is believed

to be anomalous. Removal efficiencies for manganese, arsenic and iron ranged from 97 to 100 percent, 95 to 98 percent and 96 to 100 percent, respectively. Removal efficiency for phosphorus ranged from 47 to 96 percent. Phosphorus removal efficiencies were not calculated for May and August because, as noted above, phosphorus concentrations were reported to be higher in the effluent than in the influent on those dates.

2.1.2 GWTS Maintenance Activities

Routine and other maintenance activities performed on the Landfill Area GWTS in 2012 are summarized in Table 2-4.

2.1.3 GWTS Related Activities Anticipated for 2013

Monitoring and maintenance activities specified in the Landfill Area Groundwater Operation and Maintenance Plan (Tetra Tech GEO and O&M, Inc., 2012b) will continue to be performed, as necessary.

2.2 Landfill Area Extraction Wells

The extraction system consists of five extraction wells (MLF, SELF-1, SELF-2, SWLF-2 and WLF) pumping at a total rate of approximately 40 to 50 gpm. Groundwater samples were collected from the extraction wells in March, July, and October 2012. Those results were included in Attachment A of the Operable Unit Three, Monitoring Program Report, 2012 (Tetra Tech GEO, 2012).

2.2.1 Extraction Rates and VOC Mass Removal

Totalizer readings were collected from each extraction well on a weekly to monthly basis during 2012 in order to evaluate extraction rates of the individual extraction wells and the system as a whole. The monthly extraction rates from the individual Landfill Area extraction wells and the total system in 2012 are summarized in Table 2-5. Total average monthly extraction rates ranged between 24.4 and 55.4 gpm, with an average for the year of 43 gpm.

The total Landfill Area extraction rates and the treatment system influent concentrations were used to estimate the VOC mass removed from Landfill Area groundwater in 2012. The Grace Property section of Table 2-6 summarizes the volume of groundwater and pounds of VOCs removed from the Grace property each year since groundwater extraction first began in

1984. The Grace property section of the table represents groundwater extracted by the former ARS (1984 through April 2011) as well as the current Landfill Area GWTS (beginning in May 2011). The reduction in annual totals for volume of groundwater removed and pounds of VOCs removed since 2009 reflects the modification of the original ARS and transition to the Landfill Area extraction system. Approximately 22.9 million gallons of groundwater were extracted and approximately 5.8 pounds of total VOCs were removed from beneath the Grace property in 2012. As of December 2012, a total of approximately 4,870 million gallons of groundwater have been extracted and more than 5,960 pounds of VOCs have been removed from the groundwater beneath the Grace property.

2.2.2 Extraction Well Maintenance Activities

Totalizer readings and depth to water measurements are collected from each extraction well on a weekly to monthly basis. These readings are used to track and evaluate the condition of the extraction wells. The following routine maintenance was performed on each extraction well on an as-needed basis:

- Redevelopment:
  - Discharge hoses, pitless adapters, check valves, pumps and motors were removed from the well and cleaned.
  - Submersible pumps were disassembled, cleaned, inspected and reassembled.
  - All parts were inspected and defective parts were replaced.
  - Muriatic acid was put into the well. Then, the entire length of the open interval was surged to force the acid through the well screen, sand pack and nearby formation. The acid was left to sit overnight.
  - Well casings were cleaned using a surge block to force water back and forth through the well screen, sand pack and nearby formation to loosen and remove any material that may have accumulated.
  - Sludge materials and other debris loosened by the surge block were pumped from the well using an airlift pump. Pumping was continued until the well water became clear.
  - Equipment was installed back in the well.
- Pump Repair
- Pump Replacement

Table 2-7 summarizes the routine maintenance that was performed on each extraction well in 2012. Figures 2-2 through 2-6 are graphs showing the flow rates and water level elevations measured in extraction wells MLF, SELF-1, SELF-2, SWLF-2 and WLF, respectively, during 2012. Maintenance activities are also indicated on each graph.

2.2.3 EXTRACTION WELL RELATED ACTIVITIES ANTICIPATED FOR 2013

Routine cleaning, inspection and maintenance of extraction wells will continue on an as-needed basis. A more-detailed maintenance plan, focusing on preventive maintenance, is included in the Landfill Area Groundwater Operation and Maintenance Plan, (Tetra Tech GEO and O&M, Inc., 2012b).

3 NORTHEAST AREA GWTS

The Northeast Area Remedial Action started operation on April 5, 2010. The remedial system consists of one extraction well (NE-1), pumping approximately 20 gpm, groundwater treatment, and reinjection into one of two reinjection wells (RE-1 and RE-2). Groundwater is extracted from NE-1 continuously, then is treated and reinjected in batches. The treatment system consists of an air stripper designed to remove VOCs to below Interim Groundwater Cleanup Levels (IGCLs) and vapor-phase carbon treatment to remove odors from the air prior to discharge. An arsenic reduction system had previously been in place, but this was removed in 2011. For more information, see the Groundwater Treatment System Report, 2011 (Tetra Tech GEO and O&M, Inc., 2012a). Figure 3-1 shows the location of the extraction/reinjection wells and the treatment building.

3.1 NORTHEAST AREA GWTS

3.1.1 GWTS MONITORING AND REMOVAL EFFICIENCY

Treatment system compliance and contaminant removal efficiency is evaluated through the collection of monthly water quality samples. Groundwater samples were collected from extraction well NE-1 and analyzed for VOCs, EPH/VPH, total arsenic, total iron and total manganese. These samples represent the treatment system influent. Samples were collected from the effluent of the treatment system and analyzed for VOCs, 1,4-dioxane, total arsenic, total iron and total manganese. The effluent samples represent the compliance point sample results, and are a measure of the quality of water being reinjected into the aquifer.

The treatment system influent and effluent water quality results for samples collected in 2012 are summarized in Tables 3-1 and 3-2, respectively. Table 3-2 also lists the groundwater discharge standards for the Northeast Area GWTS. As indicated in Table 3-1, 1,1-dichloroethene (VDC) concentrations in the treatment system influent (extraction well NE-1) ranged between 52 µg/L in July 2012 and 32 µg/L in December 2012. As shown in the Table 3-2, all effluent water quality results were below discharge standards. Table 3-3 summarizes the Northeast Area GWTS VOC removal efficiency for 2012, which ranged between 98 and 100 percent.

3.1.2 AIR DISCHARGE

Air discharge requirements for the Northeast Area treatment system are based on the Massachusetts Rules for Remedial Air Emissions (310 CMR 40.0049). This regulation states that air-emission control treatment devices shall be designed, constructed, and operated in a manner that will ensure removal of at least 95% of the emitted oil and hazardous materials, on a weight basis. The regulation also states that treatment of point-source remedial air emissions is not required at a disposal site if the untreated emissions would be at or below a level of no significant risk to health, safety, public welfare, and the environment.

Based on the analysis described in Attachment A of the Northeast Area Groundwater Remedial Action Report (GeoTrans and O&M, Inc., 2011), untreated emissions from the Northeast Area treatment system present no significant risk to health, safety, public welfare, and the environment. That analysis was done using the following concentrations:

- VDC 200 µg/L
- Vinyl Chloride 5.2 µg/L
- Benzene 1.6 µg/L

Since influent VDC, vinyl chloride and benzene concentrations remain at or below those levels, as shown in Table 3-1, untreated emissions from the Northeast Area treatment system still present no significant risk to health, safety, public welfare, and the environment. Vapor-phase carbon, however, has been included as part of the treatment system for potential odor control only. While it will remove some oil and hazardous materials from the vapor-phase, it is not being operated to achieve 95% removal. Nevertheless, the treatment system air emissions do not present a significant risk to health, safety, public welfare, or the environment.

3.1.3 GWTS MAINTENANCE ACTIVITIES

Table 3-4 summarizes the maintenance activities done on the Northeast Area GWTS during 2012.

3.1.4 GWTS RELATED ACTIVITIES ANTICIPATED FOR 2013

Monitoring and maintenance activities specified in the Northeast Area Groundwater Operation and Maintenance Plan (O&M, Inc. and GeoTrans, 2010) will continue to be performed, as necessary. In February 2013, Grace submitted an evaluation of the Northeast Area remedial action (Tetra Tech, 2013). The evaluation was required to be done after three years of system operation by the Record of Decision (USEPA, 2005), to determine if pumping could be

discontinued. The evaluation concluded that the Northeast Area remedial action had met its stated goal of reducing the mass of contamination in the most concentrated part of the plume and recommended that the system be shut down. If USEPA agrees with the recommendation, the Northeast Area remedial action will be shut down sometime in 2013.

3.2 NORTHEAST AREA EXTRACTION/REINJECTION WELLS

The current extraction/reinjection system consists of one extraction well, NE-1, pumping approximately 20 gpm with treated groundwater reinjected into one of two reinjection wells, RE-1 or RE-2.

3.2.1 EXTRACTION RATES AND VOC MASS REMOVAL

Totalizer readings were collected from extraction well NE-1 on weekly to monthly basis during 2012. The monthly extraction rates for NE-1 in 2012 are summarized in Table 3-5. Average monthly extraction rates ranged between 16.9 and 19.9 gpm with an annual average extraction rate of 19.1 gpm. The extraction rates and the water quality results from extraction well NE-1 were used to estimate the mass of VOCs removed by the Northeast Area remedial action in 2012. As indicated in Table 2-6, the Northeast Area remedial action extracted approximately 10.1 million gallons of groundwater and removed approximately 3.7 pounds of total VOCs in 2012.

3.2.2 EXTRACTION/REINJECTION WELL MAINTENANCE ACTIVITIES

Depth to water measurements are collected from extraction well NE-1 on a weekly to monthly basis. Water levels are recorded every two hours with pressure transducers in reinjection wells RE-1 and RE-2. These readings are used to track and evaluate the condition of the extraction/reinjection wells. Figure 3-2 is a graph showing the flow rate and water level elevation measured in extraction well NE-1 in 2012. Figures 3-3 and 3-4 are graphs showing the water level elevations and reinjection rates in reinjection wells RE-1 and RE-2, respectively, during 2012. The water level elevations on the RE-1 and RE-2 graphs show a water level range of approximately 13 to 20 feet. The lower water levels, which resemble a line at approximately elevation 138 feet NGVD for RE-2 and a sloping line from 139 to 136 feet NGVD for RE-1, represent the non-injection water level elevation for each of the two wells. The higher and more variable water levels are the water levels during reinjection. As shown on Figures 3-3 and 3-4,

treated groundwater was injected into reinjection well RE-2 for most of the 2012. There were two short time periods in January-February and October 2012 when water was injected into reinjection well RE-1. Reinjection well RE-2 was redeveloped on January 23, 2012 and October 9, 2012. The discharge line for NE-1 was repaired on January 4, 2012, and the gate valve was replaced on November 28, 2012. Reinjection well RE-1 did not require any maintenance in 2012.

3.2.3 EXTRACTION/REINJECTION WELL RELATED ACTIVITIES ANTICIPATED FOR 2013

Monitoring and maintenance activities specified in the Northeast Area Groundwater Operation and Maintenance Plan (O&M, Inc. and GeoTrans, 2010) will continue to be performed, as necessary.

4 REFERENCES

GeoTrans and O&M, Inc., 2011, Northeast Area Groundwater Remedial Action Report, Revision 01, January 20, 2011.

O&M, Inc. and GeoTrans, Inc. 2010. Northeast Area Groundwater Operation and Maintenance Plan, Revision 01, June 2010.

Tetra Tech GEO, 2012. Operable Unit Three Monitoring Program Report, 2012, December 20, 2012.

Tetra Tech GEO and O&M, Inc., 2012a. Groundwater Treatment System Report, 2011, June 15, 2012.

Tetra Tech GEO and O&M, Inc., 2012b, Landfill Area Groundwater Operation and Maintenance Plan, Revision 02, July 10, 2012.

Tetra Tech GEO and O&M, Inc., 2012c, Final Landfill Area Groundwater Remedial Action Report, September 25, 2012.

Tetra Tech, 2013. Letter *RE: Evaluation of Northeast Area Remedial Action*, February 25, 2013.

USEPA, 2005. Record of Decision, W.R. Grace & Co. (Acton Plant) Superfund Site, Operable Unit Three, September 2005

TABLES

Table 2-1. Landfill Area Groundwater Treatment System Sampling Results.

	Discharge Limits	1/5/2012	1/26/2012	1/27/2012	1/30/2012	1/31/2012	2/23/2012	2/29/2012	3/19/2012	4/11/2012	4/13/2012	4/30/2012	5/14/2012	5/31/2012
Influent														
VOCs														
1,1-Dichloroethene	NA	7.1	NS	NS	NS	NS	8.8	12	8.5	11	NS	NS	8.8	NS
1,2-Dichloroethane	NA	2.4	NS	NS	NS	NS	1.7	1.5	1.9	1.4	NS	NS	1.4	NS
1,2-Dichloropropane	NA	1.3	NS	NS	NS	NS	1.4	1.1	1.2	1.2	NS	NS	1.2	NS
2-Butanone	NA	ND (5)	NS	NS	NS	NS	ND (10)	ND (5)	ND (5)	ND (5)	NS	NS	ND (5)	NS
Benzene	NA	11	NS	NS	NS	NS	13	11	12	7.7	NS	NS	11	NS
Chloroethane	NA	0.45 J	NS	NS	NS	NS	ND (2)	ND (1)	0.42 J	0.55 J	NS	NS	0.39 J	NS
Methyl tert butyl ether	NA	ND (1)	NS	NS	NS	NS	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Methylene Chloride	NA	ND (1)	NS	NS	NS	NS	ND (2)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Trichloroethene	NA	ND (1)	NS	NS	NS	NS	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Vinyl Chloride	NA	3.4	NS	NS	NS	NS	4.4	4.7	3.5	4.2	NS	NS	3.9	NS
1,4-Dioxane	NA	3.72	NS	NS	NS	NS	3.2	3.04	4.28	3.95	NS	NS	3.9	NS
SVOCs														
bis (2-chloroethyl) ether	NA	ND (10)	NS	NS	NS	NS	NS	ND (9.4)	ND (9.4)	ND (9.4)	NS	NS	ND (9.4)	NS
bis (2-ethylhexyl) phthalate	NA	ND (10)	NS	NS	NS	NS	NS	ND (9.4)	ND (9.4)	ND (9.4)	NS	NS	ND (9.4)	NS
Metals														
Arsenic	NA	36.6	NS	NS	NS	NS	29	61.6	35.2	31.3	NS	NS	31.2	NS
Beryllium	NA	ND (1)	NS	NS	NS	NS	NS	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Chromium	NA	ND (2)	NS	NS	NS	NS	NS	ND (2)	ND (2)	ND (2)	NS	NS	ND (2)	NS
Iron	NA	9580	NS	NS	NS	NS	10000	13800	9350	9630	NS	NS	9090	NS
Lead	NA	ND (1)	NS	NS	NS	NS	NS	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Manganese	NA	3580	NS	NS	NS	NS	3300	3400	3450	3490	NS	NS	3410	NS
Nickel	NA	13.7	NS	NS	NS	NS	NS	13.1	13.8	13	NS	NS	14.1	NS
Other														
Total Phosphorus	NA	76.3	NS	NS	NS	NS	NS	165	71.7	46.5	NS	NS	39.7	NS
Effluent														
VOCs														
1,1-Dichloroethene	MO	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
1,2-Dichloroethane	MO	2	1.8	1.7	1.7	1.7	1.4	1.4	1.2	1.3	NS	NS	ND (1)	NS
1,2-Dichloropropane	MO	1.2	1	1.1	1.1	1.1	1	0.95 J	0.85 J	1.1	NS	NS	ND (1)	NS
2-Butanone	MO	ND (5)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	1.7 J	1 J	ND (5)	NS	NS	38	NS
Benzene	MO	2.4	ND (1)	ND (1)	ND (1)	1.1	1.6	1.2	0.52 J	1.3	NS	NS	ND (1)	NS
Chloroethane	MO	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	0.31 J	ND (1)	ND (1)	NS	NS	ND (1)	NS
Methyl tert butyl ether	MO	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Methylene Chloride	MO	ND (1)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (1)	0.29 J	0.21 J	NS	NS	ND (1)	NS
Trichloroethene	MO	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Vinyl Chloride	MO	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
1,4-Dioxane	MO	2.48	1.5	1.3	1.5	1.9	1.8	1.67	1.84	2.33	2.1	NS	ND (0.196)	NS
SVOCs														
bis (2-chloroethyl) ether	MO	ND (9.4)	NS	NS	NS	NS	NS	ND (9.4)	ND (9.4)	ND (9.4)	NS	NS	ND (9.4)	NS
bis (2-ethylhexyl) phthalate	MO	ND (9.4)	NS	NS	NS	NS	NS	ND (9.4)	ND (9.4)	ND (9.4)	NS	NS	ND (9.4)	NS
Metals														
Arsenic	4* / 4*	ND (1)	NS	NS	NS	NS	ND (1)	ND (1)	1.6	1	NS	NS	ND (1)	NS
Beryllium	MO	ND (1)	NS	NS	NS	NS	NS	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	NS
Chromium	579.3 / 27.7	ND (2)	NS	NS	NS	NS	NS	ND (2)	2.6	ND (2)	NS	NS	ND (2)	NS
Iron	NAC / 1000	ND (100)	NS	NS	NS	NS	ND (100)	ND (100)	ND (100)	140	NS	NS	ND (100)	NS
Lead	14 / 0.5	ND (1)	NS	NS	NS	NS	NS	ND (1)	ND (1)	***38***	NS	ND (1)	ND (1)	NS
Manganese	MO	ND (1)	NS	NS	NS	NS	ND (10)	1.2	ND (1)	7.3	NS	NS	3.3	NS
Nickel	145.2 / 16.1	10.3	NS	NS	NS	NS	NS	10.5	10.7	13.7	NS	NS	ND (1)	NS
Other														
Total Phosphorus	NAC / 18	ND (6)	NS	NS	NS	NS	NS	ND (6)	14.9	6.6	NS	NS	***190***	ND (10)

Table 2-1. Landfill Area Groundwater Treatment System Sampling Results.

	Discharge Limits	6/5/2012	7/10/2012	8/20/2012	9/13/2012	10/1/2012	10/2/2012	10/11/2012	11/12/2012	12/4/2012
Influent										
VOCs										
1,1-Dichloroethene	NA	9.2	10	8.4	8.5	NS	NS	8.2	8.3	8.8
1,2-Dichloroethane	NA	1.6	2	1.7	1.4	NS	NS	1.6	1.4	1.5
1,2-Dichloropropane	NA	1.3	0.99 J	1.1	0.88 J	NS	NS	1.2	0.95 J	0.93 J
2-Butanone	NA	ND (5)	ND (5)	ND (10)	ND (10)	NS	NS	ND (10)	ND (10)	ND (10)
Benzene	NA	16	9.4	9.4	11	NS	NS	12	12	12
Chloroethane	NA	0.47 J	0.61 J	0.54 J	0.53 J	NS	NS	0.45 J	ND (2)	ND (2)
Methyl tert butyl ether	NA	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Methylene Chloride	NA	ND (1)	ND (1)	ND (2)	ND (2)	NS	NS	ND (2)	ND (1)	ND (1)
Trichloroethene	NA	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Vinyl Chloride	NA	3.6	3.9	4.1	3.4	NS	NS	2.9	3.5	3.4
1,4-Dioxane	NA	3.66	3.3	3.9	3.5	NS	NS	2.9	2.9	2.7
SVOCs										
bis (2-chloroethyl) ether	NA	ND (9.4)	ND (9.4)	ND (9.3)	ND (9.4)	NS	NS	ND (9.4)	ND (9.9)	ND (9.5)
bis (2-ethylhexyl) phthalate	NA	ND (9.4)	ND (9.4)	ND (9.3)	ND (9.4)	NS	NS	ND (9.4)	ND (9.9)	ND (9.5)
Metals										
Arsenic	NA	52.9	39.2	34	31	NS	NS	44	42	41
Beryllium	NA	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Chromium	NA	ND (2)	ND (2)	ND (5)	ND (5)	NS	NS	3.4 J	ND (5)	ND (5)
Iron	NA	14900	10200	11000 B	10000 B	NS	NS	12000	10000	10000
Lead	NA	ND (1)	ND (1)	0.31 J	0.38 J B	NS	NS	0.36 J	0.48 J B	2.4
Manganese	NA	3420	3420	3000	2900 B	NS	NS	3000	3000	3100
Nickel	NA	14	14.1	11	11	NS	NS	14	14	13
Other										
Total Phosphorus	NA	74.7	40.5	ND (10)	110	53	37	250	67	56
Effluent										
VOCs										
1,1-Dichloroethene	MO	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	0.39 J
1,2-Dichloroethane	MO	ND (1)	ND (1)	0.61 J	0.84 J	NS	NS	0.76 J	0.69 J	1.2
1,2-Dichloropropane	MO	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
2-Butanone	MO	0.89 J	1.2 J	ND (10)	ND (10)	NS	NS	ND (10)	ND (10)	ND (10)
Benzene	MO	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Chloroethane	MO	ND (1)	ND (1)	0.46 J	0.31 J	NS	NS	ND (2)	ND (2)	ND (2)
Methyl tert butyl ether	MO	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Methylene Chloride	MO	ND (1)	0.37 J	ND (2)	ND (2)	NS	NS	ND (2)	ND (1)	ND (1)
Trichloroethene	MO	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Vinyl Chloride	MO	ND (1)	0.25 J	0.35 J	0.21 J	NS	NS	0.23 J	ND (0.5)	ND (0.5)
1,4-Dioxane	MO	2.08	1.67	1.6	1.6	NS	NS	1.6	1.5	1.8
SVOCs										
bis (2-chloroethyl) ether	MO	ND (9.4)	ND (9.4)	ND (9.3)	ND (9.4)	NS	NS	ND (9.3)	ND (9.7)	ND (9.5)
bis (2-ethylhexyl) phthalate	MO	ND (9.4)	ND (9.4)	ND (9.3)	ND (9.4)	NS	NS	ND (9.3)	ND (9.7)	ND (9.5)
Metals										
Arsenic	4* / 4*	1.1	ND (1)	ND (1)	0.59 J	NS	NS	0.95 J	0.73 J	0.81 J
Beryllium	MO	ND (1)	ND (1)	ND (1)	ND (1)	NS	NS	ND (1)	ND (1)	ND (1)
Chromium	579.3 / 27.7	ND (2)	ND (2)	ND (5)	ND (5)	NS	NS	1.9 J	ND (5)	1.1 J
Iron	NAC / 1000	302	ND (100)	22 J B	190 B	NS	NS	57 J	420	39 J
Lead	14 / 0.5	ND (1)	1.2	0.79 J	0.97 J B	NS	NS	0.45 J	0.57 J B	0.41 J
Manganese	MO	92.4	31.1	7.5 J	17 B	NS	NS	12	8.9	9.8
Nickel	145.2 / 16.1	9.3	10.9	8.5 J	8.7 J	NS	NS	11	13	9.2 J
Other										
Total Phosphorus	NAC / 18	ND (6)	ND (6)	***25***	***58***	14	ND (10)	***66***	ND (10)	8 J

Concentrations in µg/L.
ND (1) - not detected at limit indicated in parentheses.
J - Estimated value
B - Compound was found in the blank and sample.
NS - Not sampled

Discharge Limits - Maximum Daily / Average Monthly
MO - Monitoring Only
NA - Not applicable
NAC - No applicable criterion
* Interim arsenic limit
Bold/Italic results exceed discharge standard

Table 2-2. Whole Effluent Toxicity Testing Results

	Discharge Limit	November 12-20, 2012
LC50		
Daphnid (Ceriodaphnia dubia)	100%	>100%
Fathead Minnow (Pimephales promelas)	100%	>100%
C-NOEC		
Daphnid (Ceriodaphnia dubia)	100%	100%
Fathead Minnow (Pimephales promelas)	100%	100%

NA - Not applicable

Discharge limits and results in % effluent concentration.

LC50 - Lethal Concentration, 50 Percent (LC50) is the % effluent concentration that would cause death in 50 percent of the test organisms over a specified period of time. For the Landfill Area treatment system, the specified time period is 48 hours.

C-NOEC - Chronic No Observed Effect Concentration (C-NOEC) is the highest tested % effluent concentration whose effect is not different from the control effect, according to the statistical test used. The NOEC is usually the highest tested % effluent concentration that causes no observable adverse effect on the test organisms (i.e., the highest tested % effluent concentration at which the values for the observed responses do not statistically differ from the controls).

Table 2-3. Landfill Area Groundwater Treatment System Removal Efficiency.

Date	Total VOCs		% Removal Efficiency
	Influent	Effluent	
1/5/12	25.65	5.6	78
2/23/12	29.3	4	86
2/29/12	30.3	5.56	82
3/19/12	27.52	3.86	86
4/11/12	26.05	3.91	85
5/14/12	26.69	ND*	100
6/5/12	32.17	0.89	97
7/10/12	26.9	1.82	93
8/20/12	25.24	1.42	94
9/13/12	25.71	1.36	95
10/11/12	26.35	0.99	96
11/12/12	26.15	0.69	97
12/4/12	26.63	1.59	94
Date	1,4-Dioxane		Removal Efficiency
	Influent	Effluent	
1/5/12	3.72	2.48	33
2/23/12	3.2	1.8	44
2/29/12	3.04	1.67	45
3/19/12	4.28	1.84	57
4/11/12	3.95	2.33	41
5/14/12	3.9	0.196	NA
6/5/12	3.66	2.08	43
7/10/12	3.3	1.67	49
8/20/12	3.9	1.6	59
9/13/12	3.5	1.6	54
10/11/12	2.9	1.6	45
11/12/12	2.9	1.5	48
12/4/12	2.7	1.8	33
Date	Manganese		Removal Efficiency
	Influent	Effluent	
1/5/12	3580	1	100
2/23/12	3300	10	100
2/29/12	3400	1.2	100
3/19/12	3450	1	100
4/11/12	3490	7.3	100
5/14/12	3410	3.3	100
6/5/12	3420	92.4	97
7/10/12	3420	31.1	99
8/20/12	3000	7.5	100
9/13/12	2900	17	99
10/11/12	3000	12	100
11/12/12	3000	8.9	100
12/4/12	3100	9.8	100

Table 2-3. Landfill Area Groundwater Treatment System Removal Efficiency.

Date	Arsenic		Removal Efficiency
	Influent	Effluent	
1/5/12	36.6	1	97
2/23/12	29	1	97
2/29/12	61.6	1	98
3/19/12	35.2	1.6	95
4/11/12	31.3	1	97
5/14/12	31.2	1	97
6/5/12	52.9	1.1	98
7/10/12	39.2	1	97
8/20/12	34	1	97
9/13/12	31	0.59	98
10/11/12	44	0.95	98
11/12/12	42	0.73	98
12/4/12	41	0.81	98
Date	Iron		Removal Efficiency
	Influent	Effluent	
1/5/2012	9580	100	99
2/23/2012	10000	100	99
2/29/2012	13800	100	99
3/19/2012	9350	100	99
4/11/2012	9630	140	99
5/14/2012	9090	100	99
6/5/2012	14900	302	98
7/10/2012	10200	100	99
8/20/2012	11000	22	100
9/13/2012	10000	190	98
10/11/2012	12000	57	100
11/12/2012	10000	420	96
12/4/2012	10000	39	100
Date	Phosphorus		Removal Efficiency
	Influent	Effluent	
1/5/12	76.3	6	92
2/29/12	165	6	96
3/19/12	71.7	14.9	79
4/11/12	46.5	6.6	86
5/14/12	39.7	190	NA
6/5/12	74.7	6	92
7/10/12	40.5	6	85
8/20/12	10	25	NA
9/13/12	110	58	47
10/1/12	53	14	74
10/2/12	37	10	73
10/11/12	250	66	74
11/12/12	67	10	85
12/4/12	56	8	86

Concentrations in µg/L

NA - Not applicable; Anomalous data

ND - Not Detected

Not detected; Detection limit is listed in table and was used to calculate removal efficiency

* 2-butanone result of 38 µg/L not included in total VOC value; assumed to be laboratory contaminant

Table 2-4. Landfill Area Groundwater Treatment System Maintenance

Routine Maintenance Activities	Frequency
Clean and calibrate pH and ORP probes in all reaction tanks	Weekly
Bleed air from all LMI chemical pumps	Weekly
Grease and rotate all electric pump motors	Monthly
Clean and calibrate Purifics unit pH probe	Monthly
Clean influent pump flow meter paddle wheel	Monthly
Site health and safety inspections	Monthly
Clean and calibrate recovery well flow meters	Quarterly
Clean pump-house discharge tank level switches	Quarterly
Clean microfilter trains with acid or bleach	As Needed
Run, fill, and empty filter press	As Needed
Clean Purifics unit ceramic membrane with hot citric	As Needed
Replace Purifics unit bag filter	As Needed
Disassemble and clean influent pumps, valves, and lines	As Needed
Clean out sludge from pump-house, discharge pump, lines, and valves	As Needed
Backflush carbon canister	As Needed
Other Maintenance Activities	**Date**
Replaced discharge line under pump-house	2/6/2012
Replaced seal pressure flow rotors on Microfilter trains	2/28/2012
Repaired/replaced all microfilter train pressure relief valves	2/14/2012
Replaced impeller in pump-house discharge pump	3/23/2012
Replaced ball valve and nut on neutralization tank	3/29/2012
Replaced pH probe #2 in reaction tank 1	3/30/2012
Replaced pH probe, glass tubes, lamps, and cables in several UV tubes in the Purifics unit	8/1/2012
Replaced effluent discharge valve pressure transmitter in Purifics unit	8/6/2012
Replaced collection tank pressure switch	8/14/2012
Replaced pH probe #1 in reaction tank 1	8/27/2012
Replaced paddle wheel and pin in influent pump flow meter	8/29/2012
Removed sludge from underground influent line	9/7/2012
Replaced main fuse in EFC-4800-48 main control cabinet	9/14/2012
Replaced profibus air valve controllers on both microfilter air valve stacks	9/25/2012
Replaced pH probe in Purifics unit	9/27/2012
Replaced pumphouse discharge hose	10/3/2012
Replaced oxone tank mixer motor	10/19/2012

Table 2-5. Monthly Landfill Area Extraction Rates

	MLF		SELF-1		SELF-2		SWLF-2		WLF		Total Landfill Area System	
Target Flow Rate (gpm)	**38**		**0.9-1.2**		**1-1.4**		**4**		**8**		**51-53**	
	Average	**Instantaneous**	**Average**	**Instantaneous**	**Average**	**Instantaneous**	**Average**	**Instantaneous**	**Average**	**Instantaneous**	**Average**	**Instantaneous**
Jan-12	35.2	38.3	0.8	1	1.4	1.5	3.7	4	7.5	8.1	47.2	51.4
Feb-12	28.7	37.9	0.7	1	1.1	1.4	3.1	4	6.5	8.3	39	51.2
Mar-12	35.8	38.3	0.7	1	0.8	1.3	3.8	4.1	7.2	8	48.3	52.7
Apr-12	36.6	38.3	0.8	1	1.5	1.5	3.9	4.1	5.8	6.5	48.6	51.4
May-12	37	38.1	0.9	1	1.3	1.3	4	4	7.6	7.8	50.8	52.2
Jun-12	17.8	38.2	0.4	1	0.5	1.3	1.9	4	3.8	8.3	24.4	52.8
Jul-12	28.7	38.1	0.9	1.2	1.1	1.5	3.3	4	6.2	8	40.2	52.8
Aug-12	28.9	40	0.8	1.1	0.9	1.3	4.4	6	6.3	8.7	41.3	57.1
Sep-12	21	39.9	0.6	1.1	0.6	1.3	2.9	6.1	3.6	7.3	28.7	55.7
Oct-12	26.4	39.6	0.7	1	0.9	1	5.4	6.1	7.9	8.9	41.3	56.6
Nov-12	38.8	39.9	0.8	1	1	1	5.9	6	8.9	9	55.4	56.9
Dec-12	36	40.5	0.8	0.9	0.9	1	5.4	6	8.2	9.5	51.3	57.9
Average Annual Rate	30.9	38.9	0.7	1.0	1.0	1.3	4.0	4.9	6.6	8.2	43.0	54.1

Instantaneous - rate indicated by flow meter during monthly monitoring
Average - flow rate calculated using monthly totalizer readings

Table 2-6. Summary of Volumes of Groundwater and VOCs Removed

	Grace Property					Northeast Area					Site-Wide Removal				
	Volume of Groundwater Removed	Pounds Removed				Volume of Groundwater Removed	Pounds Removed				Volume of Groundwater Removed	Pounds Removed			
Year	Million Gallons	TVOC	VDC	Benzene	Vinyl Chloride	Million Gallons	TVOC	VDC	Benzene	Vinyl Chloride	Million Gallons	TVOC	VDC	Benzene	Vinyl Chloride
1984	3.9	23.8	18.3	0.9	3.8	-	-	-	-	-	3.9	23.8	18.3	0.9	3.8
1986	222.6	898.0	747.0	34.8	81.5	-	-	-	-	-	222.6	898.0	747.0	34.8	81.5
1987	199.1	507.6	330.7	63.9	65.8	-	-	-	-	-	199.1	507.6	330.7	63.9	65.8
1988	247.2	563.4	347.7	59.1	94.9	-	-	-	-	-	247.2	563.4	347.7	59.1	94.9
1989	198.4	248.5	184.7	14.2	28.6	-	-	-	-	-	198.4	248.5	184.7	14.2	28.6
1990	279.8	293.6	228.4	16.5	47.6	-	-	-	-	-	279.8	293.6	228.4	16.5	47.6
1991	46.2	37.1	23.9	4.9	7.1	-	-	-	-	-	46.2	37.1	23.9	4.9	7.1
1992	234.9	283.2	103.8	60.7	32.8	-	-	-	-	-	234.9	283.2	103.8	60.7	32.8
1993	216.1	165.3	73.8	38.5	24.7	-	-	-	-	-	216.1	165.3	73.8	38.5	24.7
1994	216.1	132.7	70.7	26.3	25.9	-	-	-	-	-	216.1	132.7	70.7	26.3	25.9
1995	211.7	150.0	77.3	33.2	23.8	-	-	-	-	-	211.7	150.0	77.3	33.2	23.8
1996	243.6	104.3	57.0	19.6	12.0	-	-	-	-	-	243.6	104.3	57.0	19.6	12.0
1997	297.3	107.8	81.3	11.9	11.7	-	-	-	-	-	297.3	107.8	81.3	11.9	11.7
1998	197.2	94.9	63.4	11.8	7.5	-	-	-	-	-	197.2	94.9	63.4	11.8	7.5
1999	196.7	164.7	123.5	14.1	12.8	-	-	-	-	-	196.7	164.7	123.5	14.1	12.8
2000	224.1	98.6	82.0	4.6	10.1	-	-	-	-	-	224.1	98.6	82.0	4.6	10.1
2001	168.2	50.2	41.8	1.9	5.3	-	-	-	-	-	168.2	50.2	41.8	1.9	5.3
2002	187.3	42.1	32.5	2.1	4.5	-	-	-	-	-	187.3	42.1	32.5	2.1	4.5
2003	198.7	45.9	28.9	4.7	7.3	-	-	-	-	-	198.7	45.9	28.9	4.7	7.3
2004	209.0	52.1	41.1	2.8	4.4	-	-	-	-	-	209.0	52.1	41.1	2.8	4.4
2005	188.4	96.7	60.5	4.5	6.7	-	-	-	-	-	188.4	96.7	60.5	4.5	6.7
2006	178.2	78.8	71.2	0.9	5.1	-	-	-	-	-	178.2	78.8	71.2	0.9	5.1
2007	150.4	62.9	49.3	1.7	3.0	-	-	-	-	-	150.4	62.9	49.3	1.7	3.0
2008	116.6	38.3	31.8	1.6	2.3	-	-	-	-	-	116.6	38.3	31.8	1.6	2.3
2009	26.1	10.5	4.7	3.6	1.4	-	-	-	-	-	26.1	10.5	4.7	3.6	1.4
2010	18.7	6.3	2.2	2.5	0.7	7.2	5.9	5.6	0.1	0.1	25.9	12.2	7.8	2.6	0.9
2011	16.0	3.2	1.1	0.8	0.4	9.9	4.5	4.2	0.1	0.1	25.9	7.7	5.3	0.9	0.5
2012	22.9	5.8	1.7	2.2	0.7	10.1	3.7	3.5	0.1	0.1	33.0	9.6	5.2	2.2	0.8
Total	**4870.6**	**5962.1**	**3892.3**	**523.6**	**688.2**	**27.2**	**14.1**	**13.3**	**0.3**	**0.4**	**4897.8**	**5976.2**	**3905.6**	**523.9**	**688.5**

Gallons Removed - Grace Property			
TVOC	VDC	Benzene	Vinyl Chloride
589.2	**384.7**	**71.4**	**90.6**

Gallons Removed - Northeast Area			
TVOC	VDC	Benzene	Vinyl Chloride
1.4	**1.3**	**0.0**	**0.0**

Gallons Removed - Site-Wide			
TVOC	VDC	Benzene	Vinyl Chloride
590.6	**386.0**	**71.5**	**90.6**

TVOC - total volatile organic compounds
VDC - 1,1-dichloroethene or vinylidene chloride

Table 2-7. Landfill Area Extraction Well Maintenance

	MLF	SELF-1	SELF-2	SWLF-2	WLF
Flow Meter Cleaning	2/9/12, 5/17/12, 8/30/12, 11/26/12	2/9/12, 5/17/12, 8/30/12, 11/26/12	2/9/12, 5/17/12, 8/30/12, 11/26/12	2/9/12, 5/17/12, 8/30/12, 11/26/12	2/9/12, 5/17/12, 8/30/12, 11/26/12
Pump Repaired or Replaced	-	1/20/12	3/14/12	-	-
Redevelopment/Pump Cleaning	10/3/12	3/14/12, 10/1/2012	3/14/12, 9/28/12	9/25/12	5/4/12, 9/25/12

Table 3-1. Northeast Area Treatment System Influent Water Quality Results

Date Sampled	1/4/2012	2/8/2012	3/1/2012	4/11/2012	5/4/2012	6/5/2012	7/10/2012
VOCs							
1,1,1-Trichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1,2,2-Tetrachloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1,2-Trichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1-Dichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1-Dichloroethene (VDC)	43	43	44	45	43	40	52
1,2-Dichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-Dichloropropane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
2-Butanone	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
2-Hexanone	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
4-Methyl-2-Pentanone	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Acetone	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Benzene	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Bromochloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromodichloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromoform	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromomethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Carbon Disulfide	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Carbon Tetrachloride	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroethane	0.46 J	0.48 J	0.66 J	0.74 J	0.56 J	0.68 J	0.57 J
Chloroform	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
cis-1,2-Dichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
cis-1,3-Dichloropropene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Dibromochloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
m,p-Xylenes	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Methyl tert butyl ether	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)	ND (3)
Methylene Chloride	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
o-Xylene	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Styrene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
trans-1,2-Dichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,3-Dichloropropene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Trichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Trichlorofluoromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Vinyl Acetate	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Vinyl Chloride	1.4	1.6	1.4	1.4	1.4	1.1	1.6
Total VOCs	44.86	45.08	46.06	47.14	44.96	41.78	54.17
EPH							
2-Methylnaphthalene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Acenaphthene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Acenaphthylene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Anthracene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Benzo(a)anthracene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Benzo(a)pyrene	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Benzo(b)fluoranthene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Benzo(g,h,i)Perylene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Benzo(k)fluoranthene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Chrysene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Dibenzo(a,h)anthracene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Fluoranthene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Fluorene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Indeno(1,2,3-cd)Pyrene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Phenanthrene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Pyrene	ND (0.4)	ND (0.41)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.408)	ND (0.4)
Aromatics, C11-C22, adjusted	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Aromatics, C11-C22, unadjusted	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Aliphatics, C19-C36, unadjusted	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Aliphatics, C9-C18	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
VPH							
Aliphatics, C5-C8, adjusted	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Aliphatics, C5-C8, unadjusted	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Aliphatics, C9-C12, adjusted	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	56.5	ND (50)
Aliphatics, C9-C12, unadjusted	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	56.5	91.3
Aromatics, C9-C10	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	50.3
Naphthalene	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
Metals							
Arsenic	3.6	4.5	3.7	3.4	3.7	3.5	3.6
Iron	149	286	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)
Manganese	66.8	61.3	68.6	63.8	65.6	64.8	64.4

Table 3-1. Northeast Area Treatment System Influent Water Quality Results

Date Sampled	8/16/2012	9/13/2012	10/10/2012	11/13/2012	12/7/2012
VOCs					
1,1,1-Trichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1,2,2-Tetrachloroethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1-Dichloroethane	-	-	-	-	-
1,1-Dichloroethene (VDC)	40	39	33	39	32
1,2-Dichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-Dichloropropane	0.21 J	ND (1)	ND (1)	ND (1)	ND (1)
2-Butanone	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Hexanone	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Methyl-2-Pentanone	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Benzene	ND (1)	ND (1)	ND (1)	1.2	1.1
Bromochloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromodichloromethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromomethane	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Carbon Disulfide	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon Tetrachloride	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroethane	0.68 J	0.66 J	0.59 J	ND (2)	0.36 J
Chloroform	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
cis-1,2-Dichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
cis-1,3-Dichloropropene	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Dibromochloromethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Methyl tert butyl ether	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methylene Chloride	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)
o-Xylene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Styrene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,2-Dichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,3-Dichloropropene	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Trichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Trichlorofluoromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Vinyl Acetate	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Vinyl Chloride	1.8	1.3	1.4	1.3	1
Total VOCs	42.69	40.96	34.99	41.5	34.46
EPH					
2-Methylnaphthalene	ND (0.93)	ND (0.92)	ND (0.97)	ND (1.9)	ND (9.6)
Acenaphthene	ND (0.93)	ND (0.92)	ND (0.97)	ND (1.9)	ND (9.6)
Acenaphthylene	ND (0.28)	ND (0.28)	ND (0.29)	2.9	ND (9.6)
Anthracene	ND (0.93)	ND (0.92)	ND (0.97)	ND (1.9)	ND (9.6)
Benzo(a)anthracene	ND (0.28)	ND (0.28)	ND (0.29)	ND (0.58)	ND (9.6)
Benzo(a)pyrene	ND (0.19)	ND (0.18)	ND (0.19)	ND (0.39)	ND (9.6)
Benzo(b)fluoranthene	ND (0.28)	ND (0.28)	ND (0.29)	ND (0.58)	ND (9.6)
Benzo(g,h,i)Perylene	ND (0.46)	ND (0.46)	ND (0.48)	ND (0.97)	ND (9.6)
Benzo(k)fluoranthene	ND (0.28)	ND (0.28)	ND (0.29)	ND (0.58)	ND (9.6)
Chrysene	ND (0.93)	ND (0.92)	ND (0.97)	ND (1.9)	ND (9.6)
Dibenzo(a,h)anthracene	ND (0.42)	ND (0.41)	ND (0.43)	ND (0.97)	ND (9.6)
Fluoranthene	ND (0.93)	ND (0.92)	ND (0.97)	ND (1.9)	ND (9.6)
Fluorene	ND (0.93)	ND (0.92)	ND (0.97)	ND (1.9)	ND (9.6)
Indeno(1,2,3-cd)Pyrene	ND (0.42)	ND (0.41)	ND (0.43)	ND (0.97)	ND (9.6)
Phenanthrene	ND (0.19)	ND (0.18)	ND (0.19)	ND (0.78)	ND (9.6)
Pyrene	ND (0.93)	ND (0.92)	ND (0.97)	ND (9.7)	ND (9.6)
Aromatics, C11-C22, adjusted	ND (93)	ND (92)	ND (97)	ND (100)	ND (100)
Aromatics, C11-C22, unadjusted	ND (93)	ND (92)	ND (97)	ND (97)	ND (96)
Aliphatics, C19-C36, unadjusted	ND (93)	ND (92)	ND (97)	ND (97)	ND (96)
Aliphatics, C9-C18	ND (93)	ND (92)	ND (97)	ND (97)	ND (96)
VPH					
Aliphatics, C5-C8, adjusted	ND (50)	ND (50)	ND (50)	ND (10)	ND (10)
Aliphatics, C5-C8, unadjusted	ND (50)	ND (50)	ND (50)	ND (10)	1.5 J
Aliphatics, C9-C12, adjusted	ND (50)	ND (50)	ND (50)	ND (10)	2.5 J
Aliphatics, C9-C12, unadjusted	ND (50)	ND (50)	ND (50)	ND (10)	2.5 J
Aromatics, C9-C10	ND (50)	ND (50)	ND (50)	ND (10)	ND (10)
Naphthalene	ND (5)	ND (5)	ND (5)	ND (1)	ND (9.6)
Metals					
Arsenic	4	4	4.4	4.4	4.6
Iron	18 J B	47 J B	20 J	ND (50)	19 J
Manganese	60	58 B	59	63	59

Notes:

ND = Not detected at limit indicated in parentheses

J = Estimated value below reporting detection limit

Concentrations in µg/L.

NS = Not sampled for particular analyte

- = Not applicable

B = Analyte detected in method blank above method detection limit but below reporting limit

Table 3-2. Northeast Area Treatment System Effluent Water Quality Results

Date Sampled	Discharge Standard	1/4/2012	2/8/2012	3/1/2012	4/11/2012	5/4/2012	6/5/2012	7/10/2012
VOCs								
1,1,1-Trichloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1,2,2-Tetrachloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1,2-Trichloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1-Dichloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1-Dichloroethene (VDC)	7	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-Dichloropropane	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
2-Butanone	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
2-Hexanone	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
4-Methyl-2-Pentanone	-	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Acetone	5	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	1.1 J
Benzene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromochloromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromodichloromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromoform	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromomethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Carbon Disulfide	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Carbon Tetrachloride	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chlorobenzene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
cis-1,2-Dichloroethene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
cis-1,3-Dichloropropene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Dibromochloromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Ethylbenzene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Methyl tert butyl ether	16	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methylene Chloride	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
o-Xylene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Styrene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,2-Dichloroethene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,3-Dichloropropene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Trichloroethene	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Trichlorofluoromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Vinyl Acetate	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Vinyl Chloride	2	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
SVOCs								
1,4-Dioxane	3	1.92	2.49	1.67	2.25	2.07	1.97	1.91
Metals								
Arsenic	10	2.7	3	3.5	3.5	3.5	3.5	3.8
Iron	-	ND (100)	380	ND (100)	359	ND (100)	ND (100)	ND (100)
Manganese	300*	80.3	61.2	67	64.7	59.3	63.7	60

Table 3-2. Northeast Area Treatment System Effluent Water Quality Results

Date Sampled	Discharge Standard	8/16/2012	9/13/2012	10/10/2012	11/13/2012	12/7/2012
VOCs						
1,1,1-Trichloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1,2,2-Tetrachloroethane	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,1-Dichloroethane	-	-	-	-	-	-
1,1-Dichloroethene (VDC)	7	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-Dichloroethane	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
1,2-Dichloropropane	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
2-Butanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Hexanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
4-Methyl-2-Pentanone	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Acetone	5	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
Benzene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromochloromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromodichloromethane	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Bromomethane	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Carbon Disulfide	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Carbon Tetrachloride	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chlorobenzene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroethane	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Chloroform	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloromethane	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
cis-1,2-Dichloroethene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
cis-1,3-Dichloropropene	-	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Dibromochloromethane	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
m,p-Xylenes	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)
Methyl tert butyl ether	16	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Methylene Chloride	5	ND (2)	ND (2)	ND (2)	ND (1)	ND (1)
o-Xylene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Styrene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Tetrachloroethene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Toluene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,2-Dichloroethene	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
trans-1,3-Dichloropropene	-	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.4)
Trichloroethene	5	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Trichlorofluoromethane	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Vinyl Acetate	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Vinyl Chloride	2	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
SVOCs						
1,4-Dioxane	3	1.9	2	1.6	1.9	1.8
Metals						
Arsenic	10	3.6	3.9	4.2	4.5	4.5
Iron	-	360 B	67 J B	2200	770	520
Manganese	300*	63	53 B	60	68	64

Notes:

ND = Not detected at limit indicated in parentheses

J = Estimated value below reporting detection limit

B = Analyte detected in method blank above method detection limit but below reporting limit

Concentrations in µg/L.

- = Not applicable

Table 3-3. Northeast Area Groundwater Treatment System Removal Efficiency.

	Total VOCs		Removal
Date	Influent	Effluent	Efficiency
1/4/2012	44.86	ND	100%
2/8/2012	45.08	ND	100%
3/1/2012	46.06	ND	100%
4/11/2012	47.14	ND	100%
5/4/2012	44.96	ND	100%
6/5/2012	41.78	ND	100%
7/10/2012	54.17	1.1	98%
8/16/2012	42.69	ND	100%
9/13/2012	40.96	ND	100%
10/10/2012	34.99	ND	100%
11/13/2012	41.5	ND	100%
12/7/2012	34.46	ND	100%

Notes:
Concentrations in µg/L
NA - Not applicable
ND - Not detected

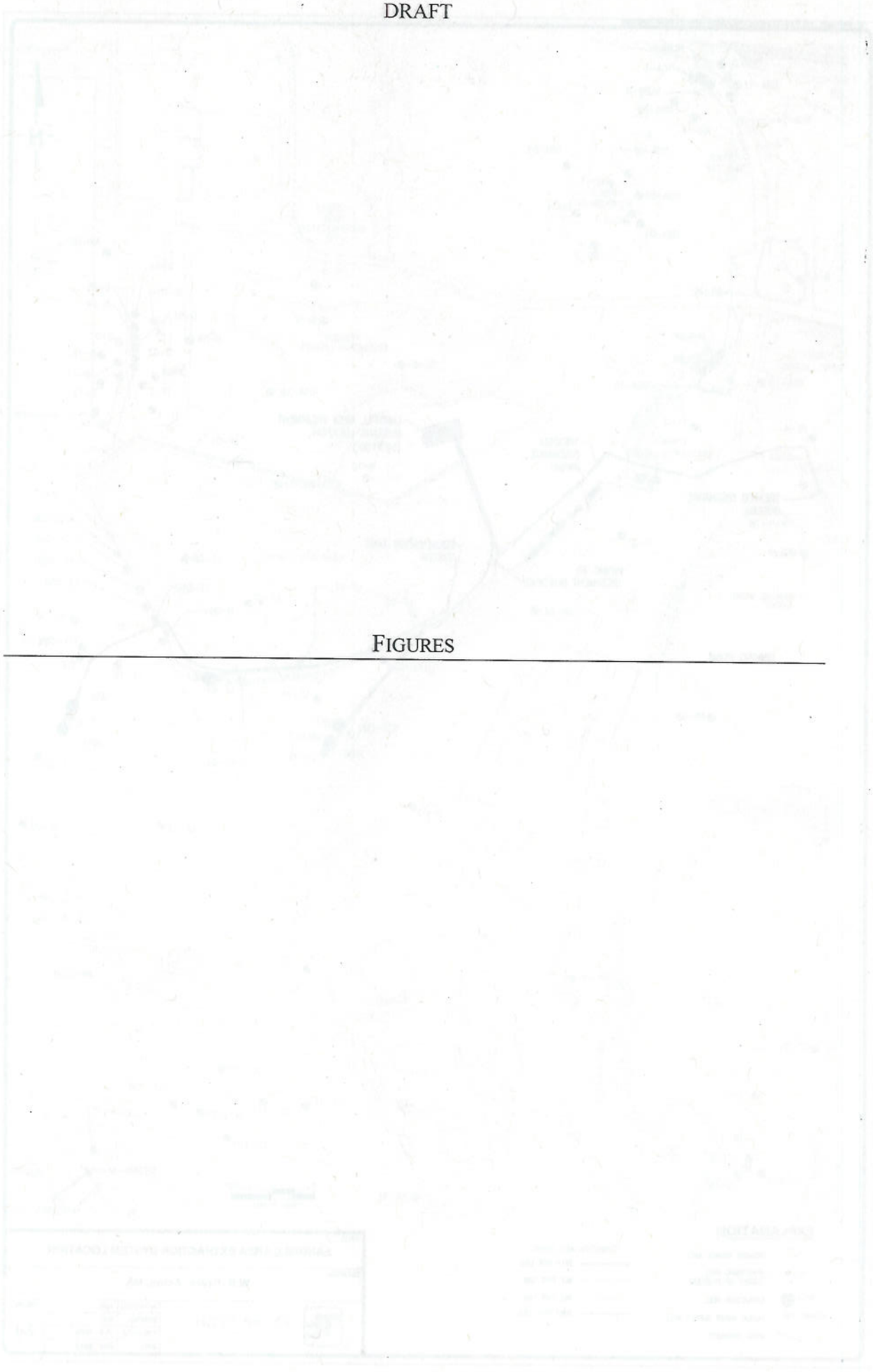
Table 3-4. Northeast Area GWTS Maintenance

Maintenance Activity	Date
Changed bag filters	approximately once a month
Removed arsenic media from bottom of discharge tank	1/19/2012
Replaced display on main panel	3/14/2012
Replaced gate valve at NE-1	10/29/2012
Replaced corroded camber at discharge	12/7/2012
Replaced corroded multi camber	12/13/2012
Changed out air stripper filter	12/13/2012

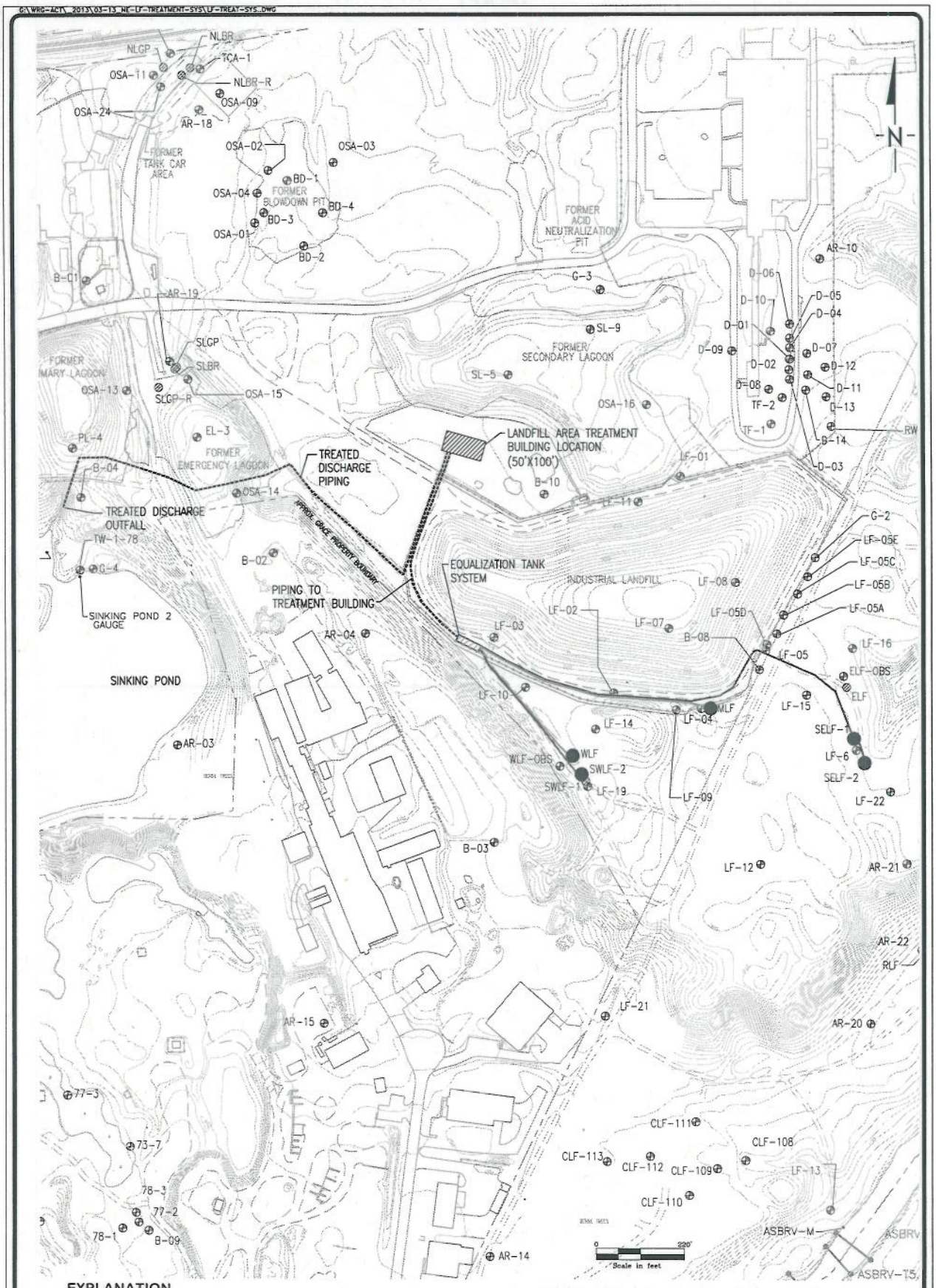
Table 3-5. Monthly Extraction Rates for Northeast Area Extraction Well NE-1

	Average	Instantaneous
Jan-12 **	16.9	20.2
Feb-12	19.4	19.7
Mar-12***	16.9	20.1
Apr-12	19.9	20
May-12	19.8	19.9
Jun-12	19	20.2
Jul-12	19.7	19.4
Aug-12	19.9	20.2
Sep-12	19.7	20.4
Oct-12	19.5	20.3
Nov-12	19.5	19.5
Dec-12	19.2	19.5
Average Annual Rate	**19.1**	**20.0**

Average - flow rate calculated using monthly totalizer readings
Instantaneous - rate indicated by flow meter during monthly monitoring
**NE-1 ran intermittently between approximately 1/4 and 1/10/12. Flow control valve on NE-1 was repaired on 1/10/12.
*** NE-1 off between 3/2/12 and 3/6/12 due to electrical damage caused by Nstar.



FIGURES



EXPLANATION

- FORMER SOURCE AREA
- R-2 ⊕ MONITORING WELL (SINGLE OR CLUSTER)
- RP-1 EXTRACTION WELL
- ASSABET 1 ⊕ PUBLIC WATER SUPPLY WELL
- RIVER TRANSECT

EXTRACTION WELL PIPING

- SELF PIPE LINE
- MLF PIPE LINE
- WLF PIPE LINE
- SWLF PIPE LINE

TITLE: **LANDFILL AREA EXTRACTION SYSTEM LOCATION**

LOCATION: **W.R. Grace, Acton, MA.**

TETRA TECH

APPROVED	ABS
DRAFTED	RMK
PROJECT#	117-3008
DATE	MAY 2013

FIGURE **2-1**

Figure 2-2. Extraction Rate and Water Level Elevation, MLF

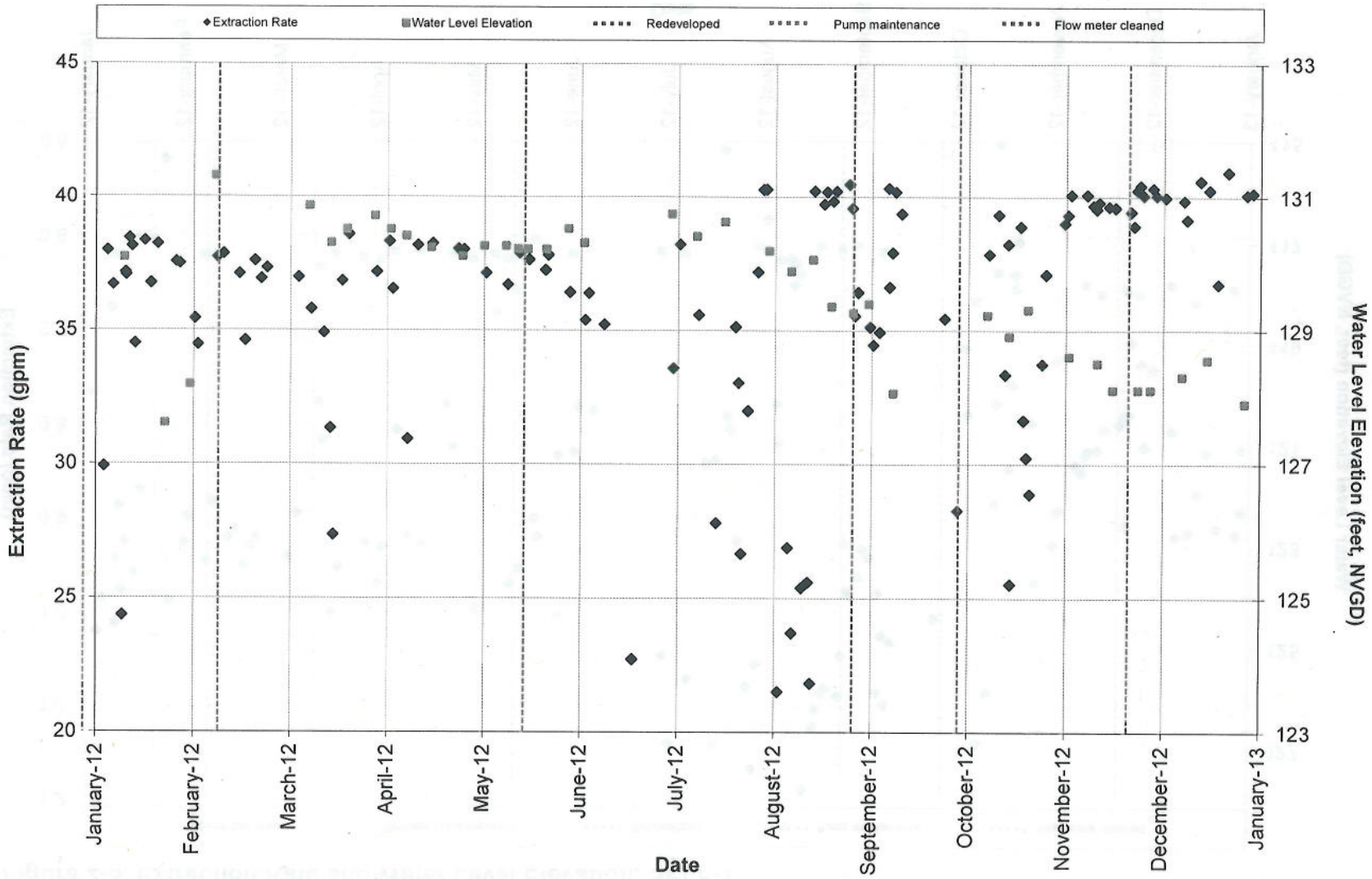


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Figure 2-3. Extraction Rate and Water Level Elevation, SELF-1

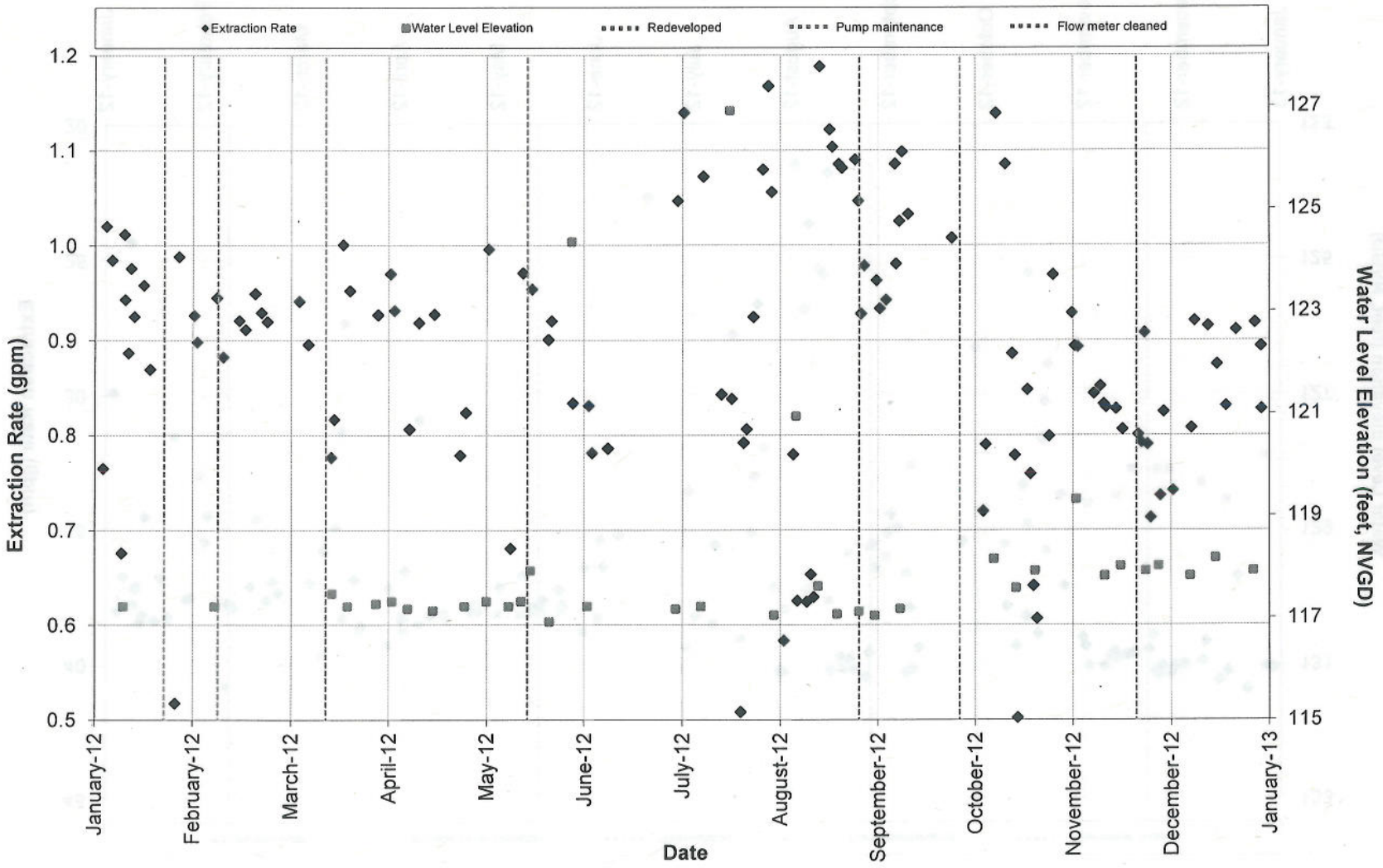

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Figure 2-4. Extraction Rate and Water Level Elevation, SELF-2

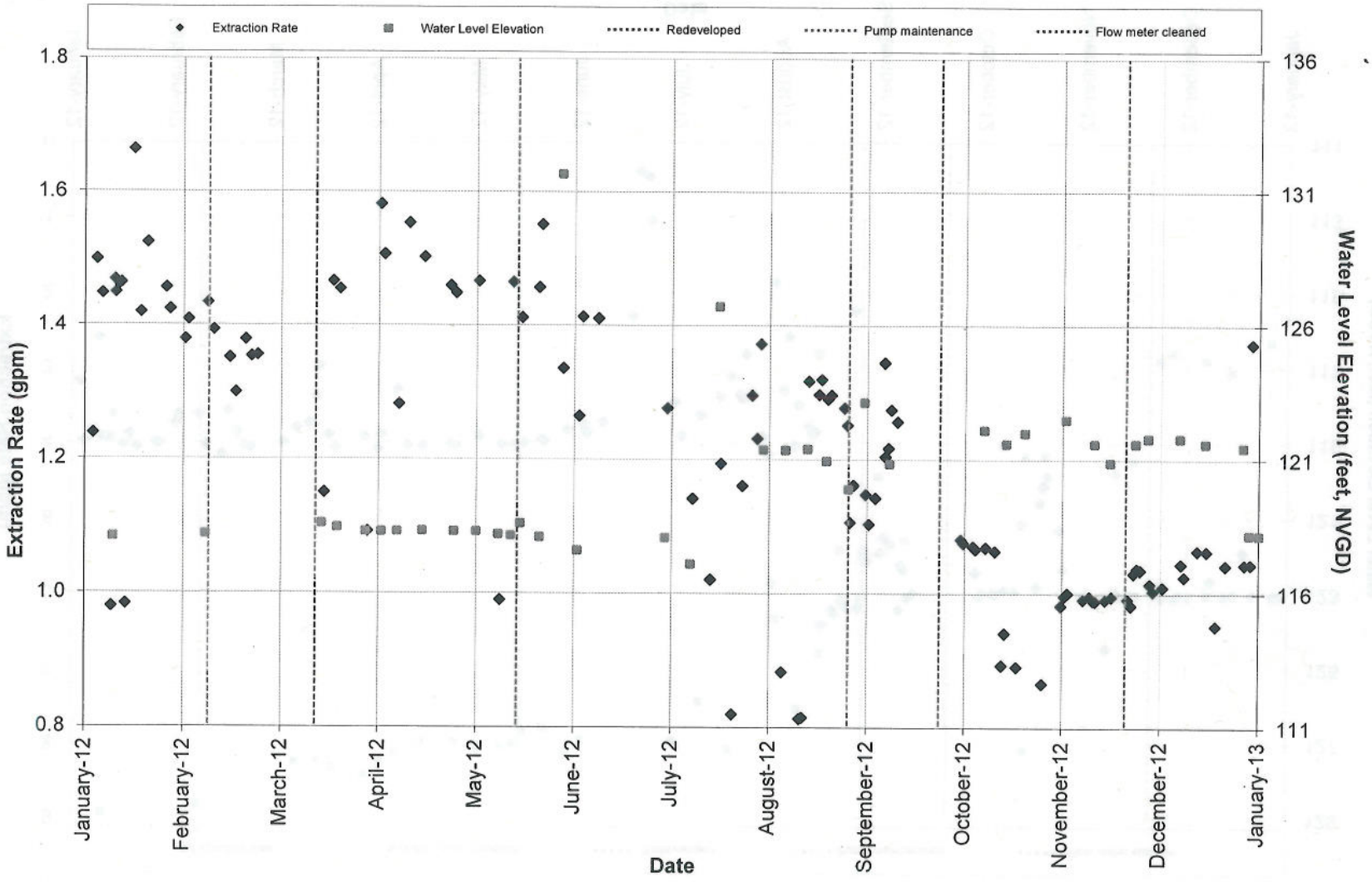

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Figure 2-5. Extraction Rate and Water Level Elevation, SWLF-2

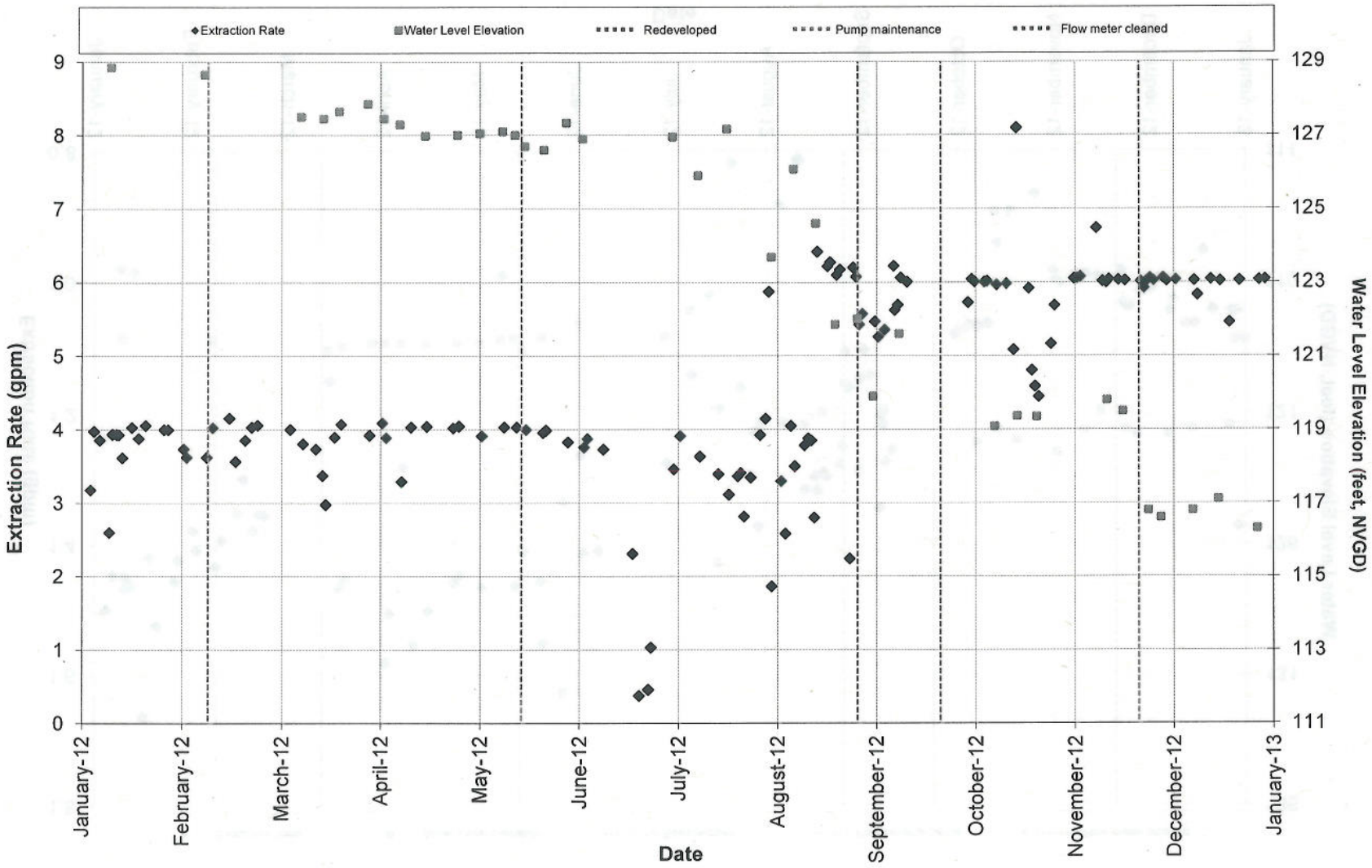

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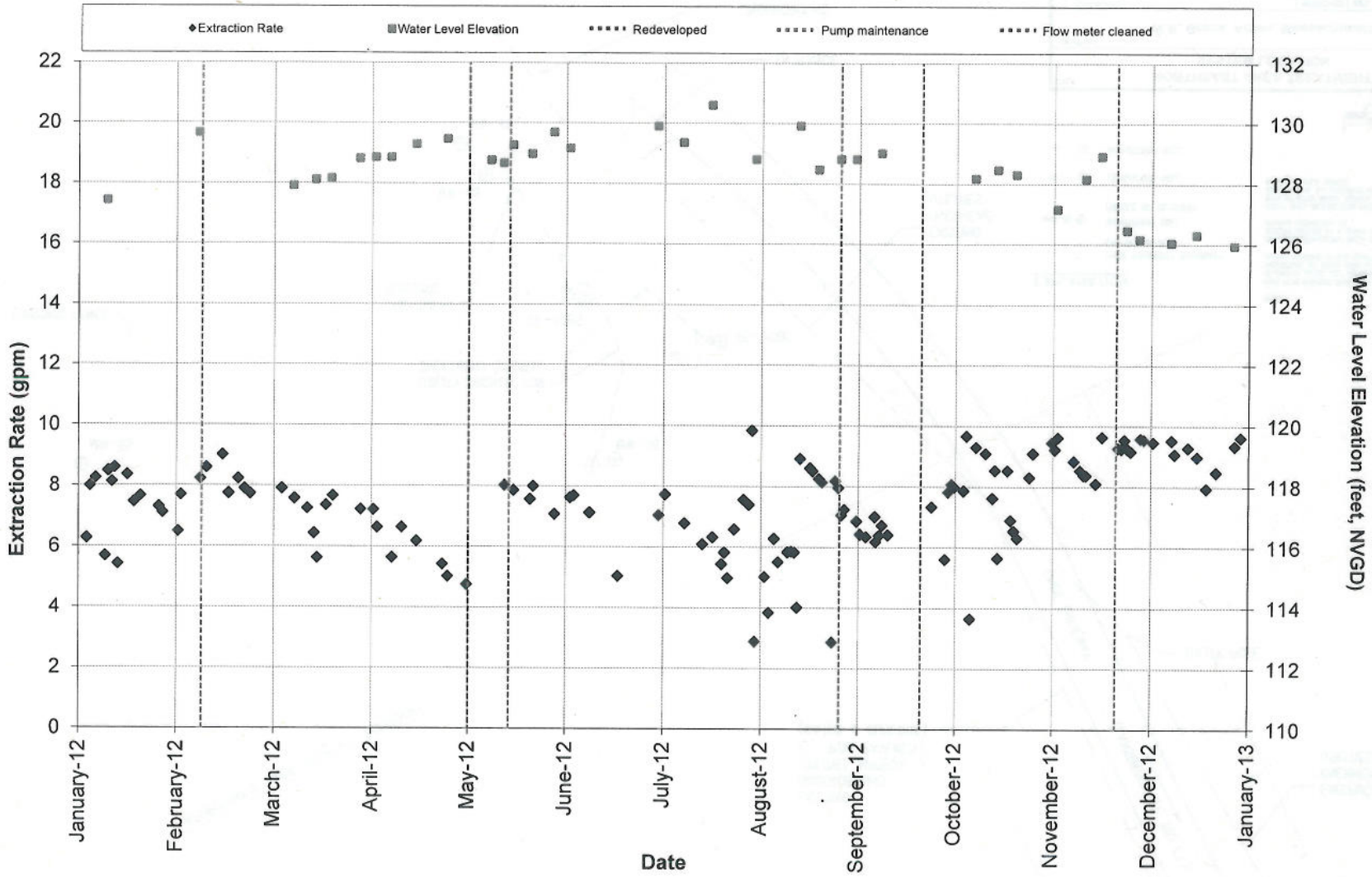
Figure 2-6. Extraction Rate and Water Level Elevation, WLF



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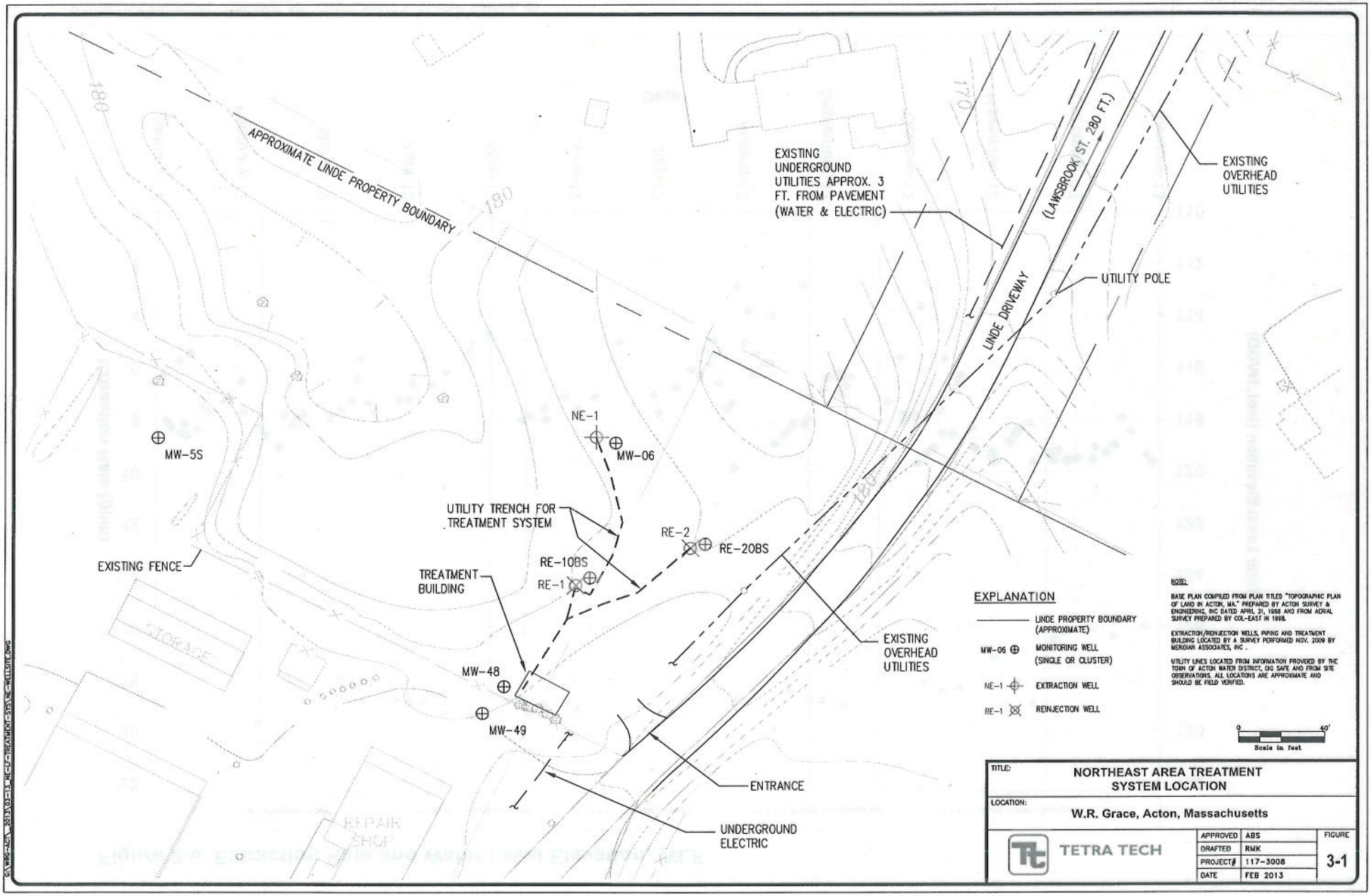

APPROXIMATE LINDE PROPERTY BOUNDARY
EXISTING UNDERGROUND UTILITIES APPROX. 3 FT. FROM PAVEMENT (WATER & ELECTRIC)
(LAWSBROOK ST. 280 FT.)
EXISTING OVERHEAD UTILITIES
UTILITY POLE
LINDE DRIVEWAY
NE-1
MW-06
MW-5S
UTILITY TRENCH FOR TREATMENT SYSTEM
RE-2
RE-20BS
RE-10BS
RE-1
EXISTING FENCE
TREATMENT BUILDING
MW-48
MW-49
EXISTING OVERHEAD UTILITIES
ENTRANCE
UNDERGROUND ELECTRIC
STORAGE
REPAIR SHOP
EXPLANATION
LINDE PROPERTY BOUNDARY (APPROXIMATE)
MW-06 MONITORING WELL (SINGLE OR CLUSTER)
NE-1 EXTRACTION WELL
RE-1 REINJECTION WELL
NOTE:
BASE PLAN COMPILED FROM PLAN TITLED "TOPOGRAPHIC PLAN OF LAND IN ACTON, MA." PREPARED BY ACTON SURVEY & ENGINEERING, INC DATED APRIL 21, 1988 AND FROM AERIAL SURVEY PREPARED BY COL-EAST IN 1998.
EXTRACTION/REINJECTION WELLS, PIPING AND TREATMENT BUILDING LOCATED BY A SURVEY PERFORMED NOV. 2009 BY MERIDIAN ASSOCIATES, INC .
UTILITY LINES LOCATED FROM INFORMATION PROVIDED BY THE TOWN OF ACTON WATER DISTRICT, DIG SAFE AND FROM SITE OBSERVATIONS. ALL LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED.
0 40'
Scale in feet
TITLE: NORTHEAST AREA TREATMENT SYSTEM LOCATION
LOCATION: W.R. Grace, Acton, Massachusetts
TETRA TECH
APPROVED ABS
DRAFTED RMK
PROJECT# 117-3008
DATE FEB 2013
FIGURE 3-1

Figure 3-2. Water Level Elevation and Flow Rate in Extraction Well NE-1

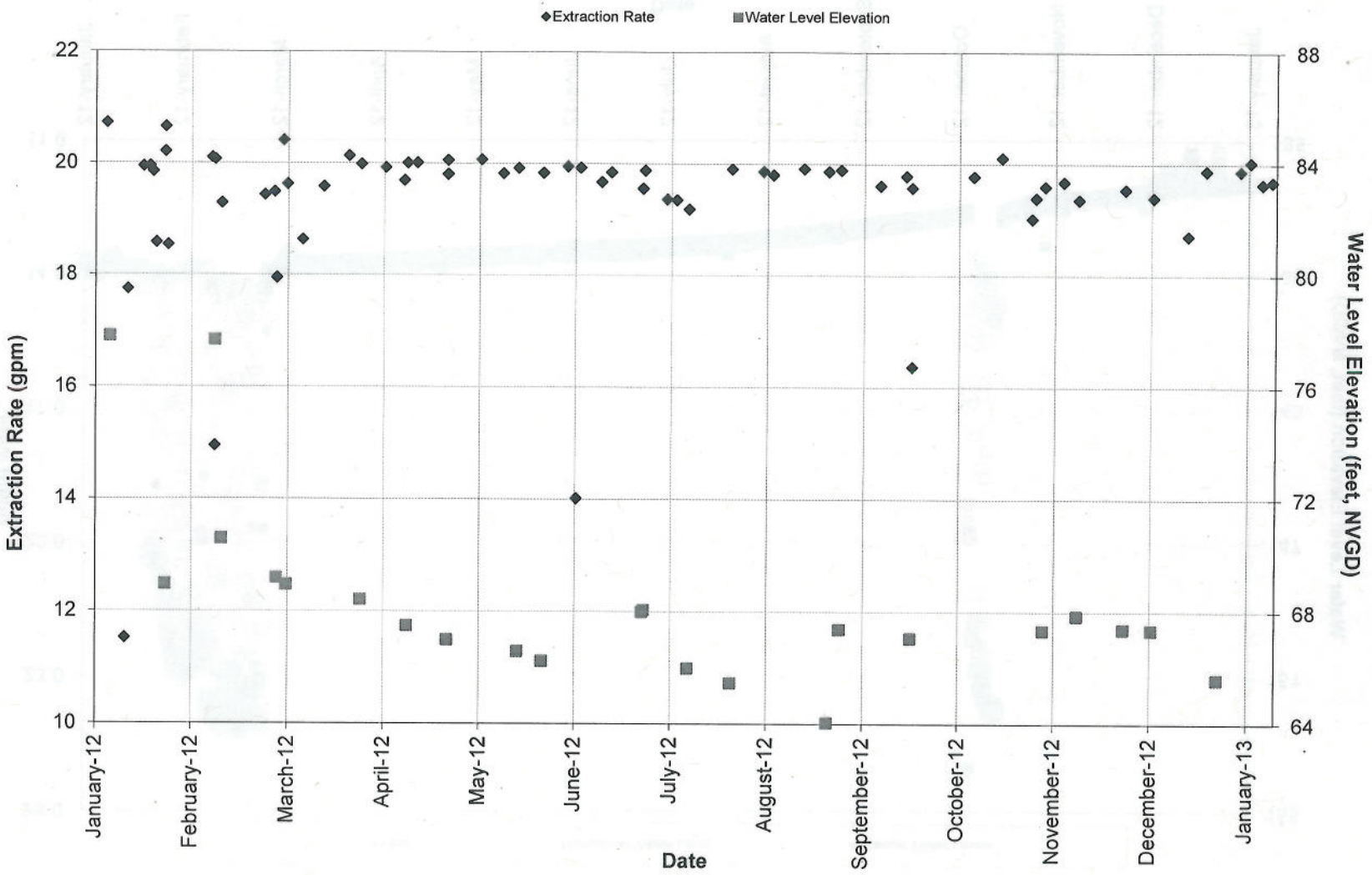
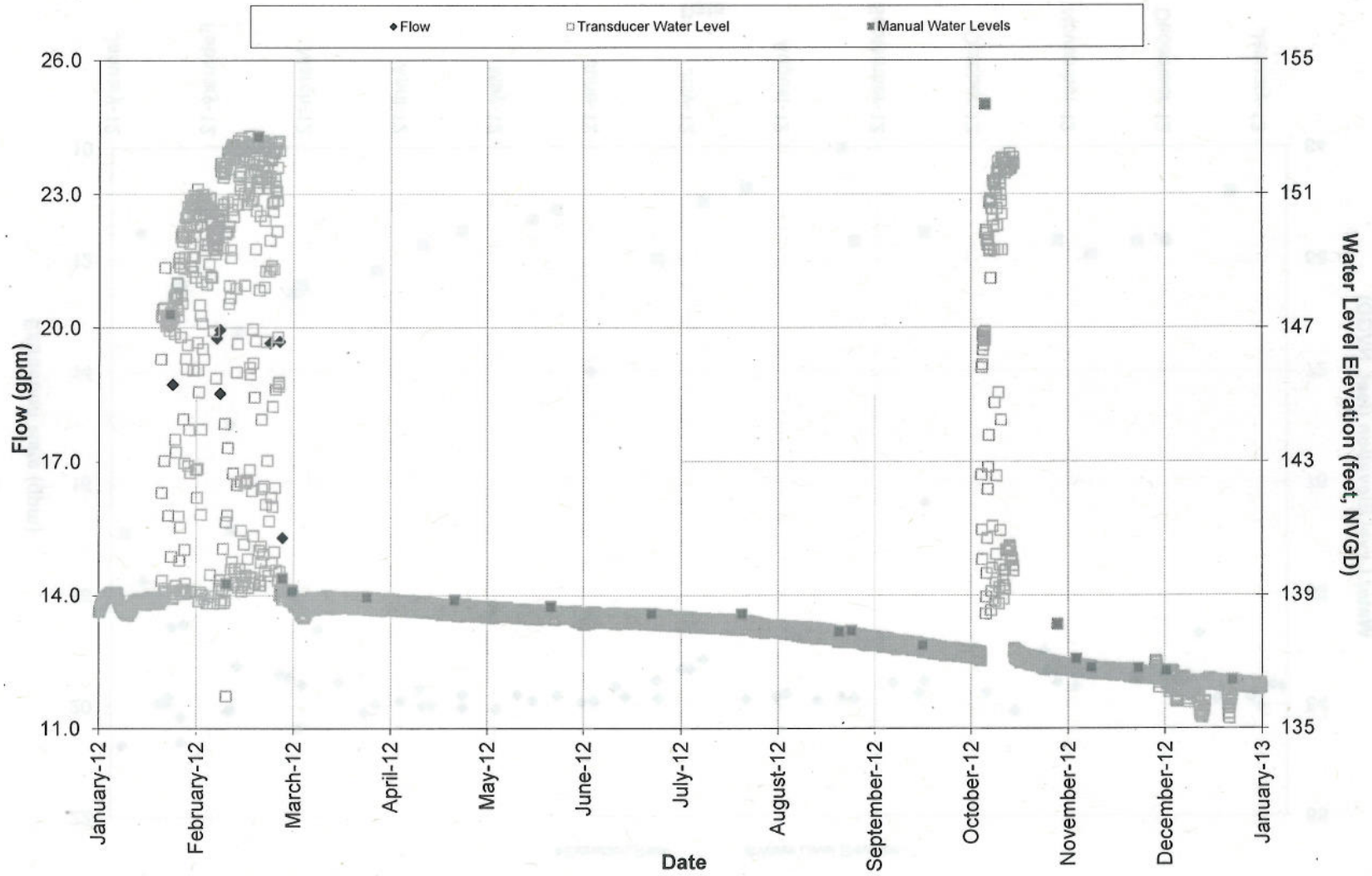
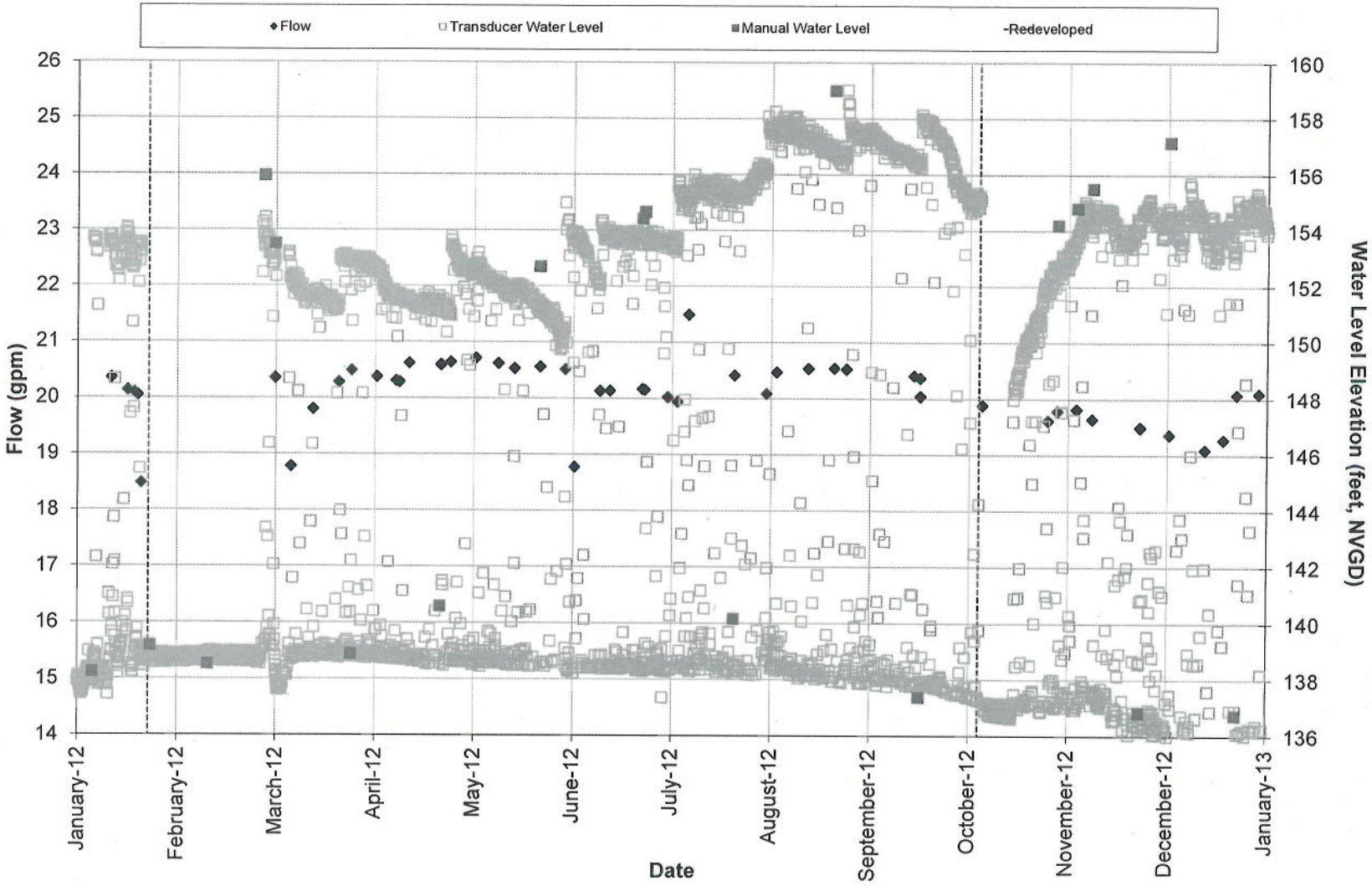


Figure 3-3. Water Level Elevation and Flow Rate, RE-1



P:\PROJECT\WRGACTON\ARS_NE_Data\NE Area Inspection.xlsRE-1 2012

Figure 3-4. Water Level Elevation and Flow Rate, RE-2



P:\PROJECT\WRGACTON\ARS_NE_Data\NE Area Inspection.xlsRE-2 2012

Golden, Derrick

From: Golden, Derrick
Sent: Thursday, June 20, 2013 1:50 PM
To: Chris Allen; Doug Halley; Matt Mostoller
Cc: Barbara Weir; McWeeney, Jennifer (DEP); Jane Ceraso; 'info@actonaces.org'
Subject: May 2013 Montly Remedial Action Status Report - W. R. Grace (Acton Plant) Superfund site - Acton & Concord, MA
Attachments: WR Grace May 2013 monhtly RD-RA_status report.pdf

All,

Attached is the May 2013, monthly remedial action status report and the effluent results for the groundwater treatment systems at the W. R. Grace (Acton Plant) Superfund site in Acton & Concord, MA.

A hard copy has been place in the Administrative Record for the site and sent it to the Acton library.

Derrick S. Golden
Remedial Project Manager
United States Environmental Protection Agency
Region 1 - EPA New England
5 Post Office Square
Mail Code OSRR07-4
Boston, MA 02109-3912

Tel: 617-918-1448
Fax: 617-918-0448

e-mail: golden.derrick@epa.gov

de maximis, inc.

135 Beaver Street
4th Floor
Waltham, MA 02452
(781) 642-8775
(781) 642-1078 FAX

June 13, 2013

Mr. Derrick Golden
United States Environmental Protection Agency
5 Post Office Square
Mail Code OSRR07-4
Boston, MA 02109-3912

Ms. Jennifer McWeeney
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

RE: Progress Report for May 2013
W.R. Grace Acton Superfund Site

Dear Mr. Golden and Ms. McWeeney:

On behalf of W.R. Grace, this Progress Report describes W. R. Grace's activities at the Acton Site during the month of May 2013:

I. Action Taken

Northeast Area Groundwater:

- Operated and maintained the Northeast Area Groundwater system. A summary of the average and instantaneous flow rates from the system, and sampling results, is attached.
- Performed the monthly system sampling on May 8, 2013. The results are attached and document continued compliance with the discharge criteria.

Landfill Area Groundwater:

- Operated the Landfill Area Treatment System using a solution of 25 ug/l ADX added after the metals removal system, and prior to the Purifics photo-catalytic oxidation unit. Sampling performed on May 8 2013 confirms this approach treats the 1,4-dioxane to below 3 ug/l. A summary of the results from that sampling event is attached.

Other:

- Performed the first round of the 2013 wetlands vegetation monitoring on May 23, 2013. The second round will be performed in August 2013.
- Received EPA comments on the 2012 Operable Unit Three Monitoring Program Report on May 23, 2013.

II. Activities Scheduled for the Next Two Reporting Periods (June through July, 2013)

Northeast Area Groundwater:

- Shut down and decommission the NE Area treatment system, pending EPA approval.

Landfill Area Groundwater:

- Continue system operation using the ADX dosage of 25 ug/l solution.

Other:

- Submit responses to EPA comments on the 2012 Operable Unit Three Monitoring Program Report.

III. Problems Encountered and Schedule Modifications

- None this reporting period.

IV. Community Relations Activities

- None this reporting period.

Please do not hesitate to call me at 781-642-8775, should you have any questions.

Sincerely,
de maximis,inc.

Thor Helgason

CC: Robert Medler – Remedium Group
Lynne Gardner – Remedium Group
Anne Sheehan – GeoTrans
Dave Fuerst – O & M, Inc.
Jack Guswa – JG Environmental

Monthly Extraction Rates for Northeast Area Extraction Well NE-1

	Average	Instantaneous
Jan-13	19.2	19.9
Feb-13	19.8	19.9
Mar-13	19.5	19.6
Apr-13	18.9	19.6
May-13	19.4	19.9

Average - flow rate calculated using monthly totalizer readings
Instantaneous - rate indicated by flow meter during monthly monitoring

Northeast Area Groundwater Treatment System Sampling Results

	Discharge Standard	1/7/2013	2/6/2013	3/5/2013	4/16/2013	5/8/2013
Influent (NE-1)						
VDC	NA	36	35	33	38	32
Benzene	NA	1.2	1.1	1	1	1.1
Vinyl Chloride	NA	1.4	1.2	U (0.5)	1.2	1.2
Arsenic, Total	NA	4.5	4.5	4.3	4.3	4.6
Iron, Total	NA	U (50)	110	22 J	27 J	29 J
Manganese, Total	NA	65	62	67	65 B	61
EPH						
2-Methylnaphthalene	NA	U (9.6)	0.071 J	0.12 J	U (0.96)	U (0.98)
Acenaphthene	NA	U (9.6)	U (0.48)	0.08 J	U (0.96)	U (0.98)
Acenaphthylene	NA	U (9.6)	U (0.29)	U (0.29)	U (0.29)	U (0.29)
Anthracene	NA	U (9.6)	U (0.48)	0.033 J	U (0.96)	U (0.98)
Benzo(a)anthracene	NA	U (9.6)	U (0.29)	U (0.29)	U (0.29)	U (0.29)
Benzo(a)pyrene	NA	U (9.6)	U (0.17)	U (0.19)	U (0.19)	U (0.2)
Benzeo(b)fluoranthene	NA	U (9.6)	U (0.29)	U (0.29)	U (0.29)	U (0.29)
Benzo(g,h,i)perylene	NA	U (9.6)	U (0.48)	U (0.48)	U (0.48)	U (0.49)
Benzo(k)fluoranthene	NA	U (9.6)	U (0.29)	U (0.29)	U (0.29)	U (0.29)
Chrysene	NA	U (9.6)	U (0.48)	U (0.96)	U (0.96)	U (0.98)
Dibenz(a,h)anthracene	NA	U (9.6)	U (0.48)	U (0.48)	U (0.48)	U (0.49)
Fluoranthene	NA	U (9.6)	U (0.48)	0.087 J	U (0.96)	U (0.98)
Fluorene	NA	U (9.6)	U (0.48)	0.099 J	U (0.96)	U (0.98)
Indeno(1,2,3-cd)pyrene	NA	U (9.6)	U (0.48)	U (0.48)	U (0.48)	U (0.49)
Naphthalene	NA	U (9.6)	0.11 JB	0.24 J	U (0.96)	0.068 J
Phenanthrene	NA	U (9.6)	0.062 JB	0.26 J	0.27 JB	0.11 JB
Pyrene	NA	U (9.6)	U (0.48)	U (4.8)	U (4.8)	U (4.9)
Aliphatics, C19-C36	NA	U (96)	U (98)	U (100)	U (49)	U (48)
Aliphatics, C9-C18	NA	U (96)	U (98)	U (100)	U (49)	U (48)
Aromatics, C11-C22, adjusted	NA	U (96)	U (98)	U (100)	U (50)	U (50)
VPH						
Benzene	NA	1.2	1.1	1	1	1
Ethylbenzene	NA	U (1)	U (1)	U (1)	U (1)	U (1)
Methyl tert-butyl ether	NA	U (1)	U (1)	U (1)	U (1)	U (1)
m&p Xylene	NA	U (2)	U (2)	U (2)	U (2)	U (2)
Naphthalene	NA	U (1)	U (1)	U (1)	U (1)	U (1)
o-Xylene	NA	U (1)	U (1)	U (1)	U (1)	U (1)
Toluene	NA	U (1)	U (1)	U (1)	U (1)	U (1)
C5-C8 Aliphatics, adjusted	NA	U (10)	U (100)	U (100)	U (5)	1.5 J
C9-C10 Aromatics	NA	U (10)	U (100)	U (100)	U (5)	U (5)
C9-C12 Aliphatics, adjusted	NA	3.1	2.7 J	2.8 J	2.9 J	2.9 J
Effluent						
VDC	7	U (1)	U (1)	U (1)	U (1)	U (1)
Benzene	5	U (1)	U (1)	U (1)	U (1)	U (1)
Vinyl Chloride	2	U (0.5)	U (0.5)	U (0.5)	U (1)	U (1)
1,4-Dioxane	3	1.8	1.9	1.9	2.1	1.9
Arsenic, Total	10	4.3	4.2	4.2	4.3	4.5
Iron, Total	NA	92	160	190	74	150
Manganese, Total	300	61	59	60	60 B	57

Concentrations in µg/L.
U (1) - not detected at limit indicated in parentheses.
B - Compound was found in the blank and sample.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is approximate

Monthly Landfill Area Extraction Rates

	MLF		SELF-1		SELF-2		SWLF-2		WLF		Total Landfill Area System	
Target Flow Rate (gpm)	38		0.9-1.2		1-1.4		4		8		51-53	
	Average	Instantaneous	Average	Instantaneous	Average	Instantaneous	Average	Instantaneous	Average	Instantaneous	Average	Instantaneous
Jan-13	39.3	40.4	0.7	0.8	1.4	1.4	5.9	6.1	9	9.3	56.3	58
Feb-13	31.8	37.1	0.5	0.6	1.2	1.4	5.2	6	6.6	7.8	45.3	52.9
Mar-13	25.1	35	0.5	0.8	0.5	0.8	5.4	6	6.5	7.4	38	50
Apr-13	33.5	40.6	0.8	1	0.7	1.1	4.1	6.3	6.8	9.4	45.9	58.4
May-13	39.8	40	0.9	0.9	0.9	0.9	5.5	6	9.2	9.4	56.3	57.2

Instantaneous - rate indicated by flow meter during monthly monitoring
Average - flow rate calculated using monthly totalizer readings

Landfill Area Groundwater Treatment System Sampling Results

	Discharge Limits	1/8/13	2/6/13	3/5/13	4/16/13	5/8/13
Influent						
VOCs						
VDC	NA	9.7	9.1	7.6	9.7	9.8
1,2 Dichloroethane	NA	1.4	1.2	1.1	1.4	1.4
1,2 Dichloropropane	NA	0.99 J	0.97 J	0.87 J	0.9 J	0.99 J
2-Butanone (MEK)	NA	U (10)	U (10)	U (10)	U (10)	U (10)
Benzene	NA	12	8.3	10	7.1	13
Chloroethane	NA	U (2)	U (2)	U (2)	U (2)	U (2)
Methlyene Chloride	NA	U (1)	U (1)	U (1)	U (1)	U (1)
MTBE	NA	U (1)	U (1)	U (1)	U (1)	U (1)
TCE	NA	U (1)	U (1)	U (1)	U (1)	U (1)
Vinyl Chloride	NA	4.4	3.3	U (0.5)	3	3.6
1,4 Dioxane	NA	3.1	3.2	2.8	3.8	2.6
SVOCs						
Bis(2-chloroethyl) ether	NA	U (9.4)	U (9.4)	U (9.5)	U (9.7)	U (9.5)
Bis(2-ethylhexyl) phthalate	NA	U (9.4)	U (9.4)	U (9.5)	U (9.7)	U (9.5)
Metals						
Arsenic	NA	39	33	40	44	77
Beryllium	NA	U (1)	U (1)	U (1)	U (1)	U (1)
Chromium	NA	1.9 J	U (5)	U (5)	U (5)	U (5)
Iron	NA	11000	8200	8500	11000	21000
Lead	NA	10	0.43 J	0.43 J B	0.68 J	1.7
Managanese	NA	3000	2700	3300	3100 B	2900
Nickel	NA	20	14	15	13	18
Other						
Phosphorus	NA	37	19	52	72	52
Effluent						
VOCs						
VDC	MO	0.63 J	0.57 J	0.73 J	0.77 J	0.94 J
1,2 Dichloroethane	MO	1.1	0.96 J	1.1	1.1	1.1
1,2 Dichloropropane	MO	U (1)	U (1)	U (1)	U (1)	U (1)
2-Butanone (MEK)	MO	U (10)	U (10)	U (10)	U (10)	U (10)
Benzene	MO	0.49 J	U (1)	0.51 J	U (1)	0.91 J
Chloroethane	MO	U (2)	U (2)	U (2)	U (2)	U (2)
Methlyene Chloride	MO	U (1)	U (1)	U (1)	U (1)	U (1)
MTBE	MO	U (1)	U (1)	U (1)	U (1)	U (1)
TCE	MO	U (1)	U (1)	U (1)	U (1)	U (1)
Vinyl Chloride	MO	U (0.5)	U (0.5)	U (0.5)	U (1)	U (1)
1,4 Dioxane	MO	1.9	2	2	2.5	2.2
SVOCs						
Bis(2-chloroethyl) ether	MO	U (9.6)	U (10)	U (9.6)	U (9.9)	U (9.6)
Bis(2-ethylhexyl) phthalate	MO	U (9.6)	U (10)	U (9.6)	U (9.9)	U (9.6)
Metals						
Arsenic	4* / 4*	0.75 J	0.73 J	1.1	0.62 J	1.1
Beryllium	MO	U (1)	U (1)	U (1)	U (1)	U (1)
Chromium III	579.3 / 27.7	U (5)	U (5)	U (5)	U (5)	U (5)
Iron	NAC / 1000	U (50)	U (50)	U (50)	U (50)	30 J
Lead	14 / 0.5	0.63 J	0.66 J	0.63 J B	0.49 J	0.59 J
Managanese	MO	4.8	7.9	0.79 J	1.2 JB	3.1
Nickel	145.2 / 16.1	9 J	9.2 J	11	9.5 J	11
Other						
Phosphorus	NAC / 18	U (10)	U (10)	U (10)	U (10)	U (10)

Concentrations in µg/L.
U (1) - not detected at limit indicated in parentheses.
J - Estimated value
Discharge Limits - Maximum Daily / Average Monthly
MO - Monitoring Only
NA - Not applicable
NAC - No applicable criterion
* Interim arsenic limit

Golden, Derrick

From: Golden, Derrick
Sent: Friday, June 07, 2013 6:44 AM
To: 'Weir, Barbara'
Subject: RE: WR Grace - Conference Call - NE area shutdown

Thanks Barb!

From: Weir, Barbara [mailto:Barb.Weir@aecom.com]
Sent: Thursday, June 06, 2013 4:34 PM
To: Golden, Derrick
Subject: RE: WR Grace - Conference Call - NE area shutdown

No problem, I will do so momentarily using the Outlook invite.

From: Golden, Derrick [mailto:Golden.Derrick@epa.gov]
Sent: Thursday, June 06, 2013 9:30 AM
To: Weir, Barbara
Subject: FW: WR Grace - Conference Call - NE area shutdown

Good morning Barb,

Looks like a call next Wed. at 1:00 would work fine for Jen. Would you please set up a call in number and e-mail it out to us when you get a chance?

Thanks!

Derrick

Derrick S. Golden
Remedial Project Manager
United States Environmental Protection Agency
Region 1 - EPA New England
5 Post Office Square
Mail Code OSRR07-4
Boston, MA 02109-3912

Tel: 617-918-1448
Fax: 617-918-0448

e-mail: golden.derrick@epa.gov

From: McWeeney, Jennifer (DEP) [mailto:jennifer.mcweeney@state.ma.us]
Sent: Wednesday, June 05, 2013 5:31 PM
To: Golden, Derrick
Subject: RE: WR Grace - Conference Call - NE area shutdown

Hi Derrick, How about next Mon or Wed at 1 pm? Jen

From: Golden, Derrick [Golden.Derrick@epa.gov]
Sent: Wednesday, June 05, 2013 4:35 PM
To: McWeeney, Jennifer (DEP)
Cc: Weir, Barbara
Subject: WR Grace - Conference Call - NE area shutdown

Hi Jen,

What afternoon next week would you be available for a conference call between myself and AECOM?

I'd like to discuss the NE area petition to shut down the treatment system.

Derrick

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receiving the revised Email, containing the renamed attachment, you can rename the file extension to its correct name.

For further information, please contact the EPA Call Center at (866) 411-4EPA (4372). The TDD number is (866) 489-4900.

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Golden, Derrick

From: Golden, Derrick on behalf of 8DB006712BE24EC29E1F41B33A6D555F-GOLDEN, DERRICK
Sent: Friday, June 07, 2013 6:44 AM
To: 'Weir, Barbara'
Subject: Accepted: WR Grace - NE Area shutdown conference call

Golden, Derrick

From: Golden, Derrick
Sent: Monday, June 10, 2013 12:25 PM
To: 'Weir, Barbara'
Subject: FW: Grace - dioxane monitoring

Hi Barb,

FYI, I asked Jen to "bug" Thor about our comment on the 2012 GW report before we provide any feedback on the NE area shutdown petition.

I'll speak with you on Wednesday afternoon.

Derrick

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e-mail: golden.derrick@epa.gov

-----Original Message-----
From: McWeeney, Jennifer (DEP) [mailto:jennifer.mcweeney@state.ma.us]
Sent: Monday, June 10, 2013 11:55 AM
To: Thor Helgason
Cc: Golden, Derrick; Stone, Marielle (DEP)
Subject: RE: Grace - dioxane monitoring

Hi Thor, I just wanted to check in with you regarding the GP's request for increased dioxane monitoring at the Acton water supply wells (and some monitoring wells), as discussed in our May 23rd, 2013 comment letter. Are you able to let us know where Grace stands on this? DEP's Water Supply program is interested to hear as well. Thank you, Jennifer McWeeney

Golden, Derrick

From: Golden, Derrick
Sent: Thursday, June 06, 2013 9:27 AM
To: 'McWeeney, Jennifer (DEP)'
Subject: RE: WR Grace - Conference Call - NE area shutdown

Hi Jen,

A call next Wednesday at 1:00 works good for AECOM and myself. I'll ask Barb to set up a call in number.

Thanks

Derrick

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Sent: Wednesday, June 05, 2013 5:31 PM
To: Golden, Derrick
Subject: RE: WR Grace - Conference Call - NE area shutdown

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Sent: Wednesday, June 05, 2013 4:35 PM
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Cc: Weir, Barbara
Subject: WR Grace - Conference Call - NE area shutdown

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e-mail: golden.derrick@epa.gov

Golden, Derrick

From: Weir, Barbara [Barb.Weir@aecom.com]
Sent: Wednesday, June 05, 2013 4:44 PM
To: Golden, Derrick
Cc: Diesl, Warren
Subject: RE: WR Grace - Conference Call - NE area shutdown

Hi Derrick,

As I mentioned on the phone – Mon and Tues next week are a little crazy but Weds, Thurs or Fri are options for Warren and me at this point.

Barb

From: Golden, Derrick [mailto:Golden.Derrick@epa.gov]
Sent: Wednesday, June 05, 2013 4:36 PM
To: McWeeney, Jennifer (DEP)
Cc: Weir, Barbara
Subject: WR Grace - Conference Call - NE area shutdown

Hi Jen,

What afternoon next week would you be available for a conference call between myself and AECOM?

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Derrick

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